### Table B-2-1 Soil Type in Indonesia

T		Organic	NPK								Water
0	Type of Sod	matter	and Ca	pł i	Solum	Colour	Fresion	Productivity	Texture	Permeability	Holding
		centent	Content		(1:1)		1				Capacity
_	Podzal (Podzalia)	ess 10%	low	3.5-5	1-20	Redio	- High	I ow to	Sandy Loam	Moderate 10	lac k
	• Red Podrol			1		Yellow		Moderate	to Clay Loam	Slow	
- 1	* Red Brown Podzoł										
	• Yellow Red Podzoł	1									
	Yellow Podzeł		1	1	1			! !			
	Mediterranean	Less 3º6	Moderate	6-7.5	1-2.0	Brown to	Moderate	Moderate to	Loam	Moderate	Moderate
	* Red Moditesranean			1		Red	to High	High	ьэ Сілу		
	* Brown Mediterranean			i							
	<ul> <li>Yellow Mediterranean</li> </ul>										
	Gaimesol	1-3%	Peor to	6-8.0	1-2.0	Gray to	High	Low to	Clay Loam	Slow	Good
	• Gray Grumusol		Moderate			Black		Moderate	to Clay		
	* Black Grumusel				1						
							ļ	1			.=
	Latenite	3-10%	Poor to	4.5-6.5	1.5-10	Red, Brown	1 ow	Moderate to	Clay	Fast	Good
	· Red Laterite		Moderate		1	to Yellow		High	1		
	• Red Brown Laterite						i				
	Yellow Brown I aterite										
	• Brown Laterite										
							1	Low to High	Sand to	Easy	lack
i.	Regosol	Poor	Poor	4.5-7.3	Varieus	Gray to	High	Low to rugh	Silt Loam	1	
	<ul> <li>Gray Regosol</li> </ul>					Brown or			Str Ecan		
	Brown Regosol					Yellowish Brown					ļ
			D. t. t	4.5-6.0	Various	Gray to	High	Low to High	Clay	Slow	
5.	ABavial	Poor	Relative High	4,3-0.0	VALIOUS	Black				1	
	• Gray Alluvial		ruga			1,1000	1	1			
	<ul> <li>Brown Alluvial</li> </ul>										
7.	Andosol	10-30%	Moderate	5-7.0	1-2.0	Black, Gray	High	Moderate to	Silt, Silt Loam	Fast	Good
<i>'</i> .	20100301		to High		1	to dark Brown	1	High	to Loam		1
8.	Rezensi	4-10%	Low	Acid and	0.5-1.0	Gray to Black	i High	Moderate	Clay and	Moderate to	Geek
<i>.</i>				6.0-8.0	1	1			Sandy	Slow	1
9.	Lithosol	None	Varied	Varied	Less than	Varied	High	Low	Sandy	Varied	
			1	ļ	0.5						- Cr
10.	Gray Hidromorphic	Moderate	Low	4.5-6.0	0.5-1.0	Yellowish Gr.	a High	Low to	Clay to	Slow	600
l			1	1			1	Moderate	Loamy Clay	et	Goo
n.	Hanosel	Low	Low		Less than	Стау	High	Low	Clay	Slow	000
			Ι.	6.0-7.5			1	Low	Sảry Clay	Slow	
12.	Low humus gley	Low	Low to	Acid	Less than	1		Low	to Sdt	51011	1
			Moderate		0.5	to Black		Low	ाठ उठा Sचेर		
13.	Humus gley	High	Low to	Acid	Less that	Black	1	LUM	1 ×704		1
			Moderate	1	0.5	Bernwich			Varied		1
14.	. Organosol (peat soil)		Low	Acid		Brownish Biack					
1		more 20%		(3.5-4.0	1	CHUL			Sandy	1	
		more 20%		1	1				Clay	1	

Source: Subagyo (1970)

			C	limate Type	*	
Target Fruit	Altitude	A1-A2	B1	B2	С	D
	(m)	· · · · · · · · · · · · · · · · · · ·	<u> </u>	Soil Water *	*	L
I. Avocado	0 to 1,500	bcd	bc	bc	bc	-
2. Banana	0 to 1,000	abcd	abc	abc	ab	-
3. Đuku	0 to 650	abcd	abc	abc	-	-
4. Durian	0 to 700	bcd	bcd	-	-	-
5. Mango	0 to 500	-	-	abed	abe	abc
6. Mangosteen	0 to 800	abcd	ab	ab	ab	-
7. Marquisa	1,000	bcd	bc	bc	-	-
8. Rambutan	0 to 600	bed	bcd	bcd	-	-
9. Salak	0 to 500	abcd	abc	abc	ab	-

Table B-2-2 Agro-ccological Requirements of Target Fruits

Source: Kaslan Tohir

### \* Climate Type:

A1 type: 12 wet months and 0 dry month A2 type: less than 12 months and 0 dry month B1 type: 9 to 10 wet months and 1 to 2 dry month B2 type: 7 to 8 wet months and 2 to 4 dry month C type: 5 to 6 wet months and 6 dry month D type: 3 to 4 wet months and 6 to 8 dry months

#### \*\* Soil Water:

- a : soil water table less than 50 cm
- b: soil water table between 50 to 150 cm
- c: soil water table between 150 to 200 cm
- d: soil water table more than 200 cm

									Tarpet	Fruits			
			Climate										
Region and Type of Soil as far as known	Height above Number of sea level wet & dry	Number of wet & dry	Average length of wet & dry	Quotient	Avocado	Banana	Durian	Lanzon	Mango	angostee	Marquisa	Rambuta	Sulak
	( <b>u</b> )	months	periode in months				C	-	ž	>		24	s
Boon West Java (lat)	266	12 - 0	11,5 - 0.3	r1	4	ជ		1				cr.	•
Minura Frim Palembano (Jat)	15	12 - 0	10,8 - 0,6	9	•	,	י ב	Þ	•	. ,	•	2	•
Biniai North Sumatra (lat)	28	12-0	10.3 - 0,7	r-	ŀ	ന	<u>م</u>	•	ł	4		. ~	
It is the Difambane Carl	100	12-0	10,3 - 1,1	10	•	1	<u>а</u>	Þ	•	ı	1	: 0	S.
Lanat, ratemoang (av) Donnlonmbub (West Sumatra (lat)	512	12 - 0	9,3 - 1,1	12	ı	മ	A	•	•	• >	•	4 0	
Frayakunioun, west outrade (20) Durok (Mest Tava Dat)	95	12-0	9,9 - 1,0	10	A	മ	D I	* * •	1	2.2	•	< Ω	24
The second and they	650	12-0	9,8 - 1,1	1	×	<u>ന</u>	Ω		•	2 2	•	: 0	2
Manayasa, west Java Var.	565	12-0	9,3 - 1,1	12	۲	മ	Ω I		٠	5 2		<u>م</u> ک	. •
Kindangan South Kalimantan (lat)	20	12-0	9,4 - 1,3	7	•	•		1	•	2 >		: ** ~	•
Thomas Aceh Oat	0	12-0	8,7 - 1,3	15	•	1	<u>م</u> (	,	ı	N.		۰ ۲	,
Kawaamo Palembang (lat)	10	0-6	8,6 - 1,8	22	,	• 1	<u> </u>	• •	•	• >	•	: \	•
Purholingeo Central Java (Jat)	4	10-0	9,1 - 1,8	20	,	m	ລ (		•	~ >		: 14	Ś
Sukabumi West Jaya (lat)	600	8-0	8,9 - 1,9	50	<	а 20.	ם נ	.) .	•	2 >	•	: :::	s
Purwakarta West Java (Jat)	82	11-0	9,1 - 2,0	53	<		ם <b>ו</b>	 _1	•		•	: cz	•
Taniuno Rava, Palembang (lat)	8	12-0	•	5	•	1 {	ב	ŀ	•		•	•	S
Banoli Bali (lat)	500	10-0	1	23	4	20 20	• [	•	•	>	•	4	
Watulimo, East Java (?)	295	10-0	•	च त	•	• •	י ב	• •	•	: >	1	,	•
Mooa Central Java (Jat)	436	10-0	•	24	<	Ωi i	2 r		ı	2 >	•	œ	S
Ciamis West Java (lat)	238	0-6	8,9 - 2,2	25	<	n i	ב (	د	•	5	'	: o:	,
Bandar Central Java (lat)	408	10-0		52	1	സ്	ລ ¢	۰.	•	• >	•	: o:	s
Scrang West Java (Jat)	25	9 - 1	7,5 - 2,1	82	<	ານ	L)	.1	•	2 2	,	•	1
Inti East Java (?)	88	0-6	8,1 - 2,5	31	•	• •	۰ ¢	۰.	4	2 >	•	Ω.	•
Sumedang, West Java (Jat)	457	9-1		22 C	¥	ц¢	э ¢	4		•	•	ĸ	S***
Tempel, Central Java (lat)	200	0-6	8,7 - 2,8	2	• •	<u>م</u> د	3 6	·		X	ŀ	ĸ	\$
Baniar West Java (lat)	40	1-6	8.4 - 2.8		<	ŋ,	3	1		>	•	،	•
Besuki, East Java (?)	87	10-1	7.4 - 2.5	ເ <u>ດີ</u>	•	• 6	• •	•	•		•	ex.	,
Ambarawa. Central Java (lat)	514	0-6	8.2 - 2.0	34	4	хî	ה בי	•	•	•	• •	: ce	•
Tradramin Aceh (7)	0	10-0	7.5 - 2.6	35	•	•	ລ (	•,	•	• >	•	ሩ <u>በ</u>	•
Kalinino Central Java (lat)	400	10-0	8.3 - 2.9	35	٠	മ	<u></u>	-1	1	٤ :	•	4	· ·
Kamak Baci Jawa ()	120	9-1	8.3 - 3.0	36	•	,	•	•	•	ž	•	- D	
Tamingues, Lass Java ()	192	9-3	8.0-3.3	37	۲	<b>*</b>	<u></u>	۲.	•	•	•	< r	• •
Diminish Utant Tarra (1)	152	1-6	8.3 - 3.1	37	۲	<u>ന</u>	<u>а</u>	-1	•	1	•	<i>.</i>	a 
Buillagu, wextoava (lay) Iv stronton, Control Tava (lat)	4	6-3	7.8 - 3.0	39	٠	മ —	٩	·	•	•	•	-	

Table B-2-3 Distribution of Target Fruits over Various Centres (1/2)

Kaliwungu, Central Java (lat) 4 Resources : Terra, GJA (1952); Some Ecological Requireme

No extreme dry months; irregular, misty climate
 Irrigated for mangosteen and lanzon.
 Regular culture proved to be impossible under local conditions.
 Special growing center

									Tarret	Fruits			
			Climate										
Region and Type of	Height above	Number of	Average length	į	Autocado	Banana	Durian	I anzon	Mango	Mangostee	Marquisa	Rambutan	Salak
Soil as tàr as known	sea level	wet & dry months	of wet & ary periode in months	Cuoncin	2000							c	,
	340	0	8.3 - 3.2	39	A	മ	റ	 1	•	t	1	4 5	 2
Mumulan, Central Java (131)		, <u>,</u>	10 17	04	A	•	Δ	ц	,	1	•	<b>.</b> 1	<u></u>
Bawen, Central Java (lat)	.40		•			1	C	,	•	•	1	к.	•
liambu East Java (?)	8	9-2	7.7 - 3.2	Ŧ	1 4		- C	<b>.</b>		>	,	••••	Ś
Pasar Minom Jakarta (Jat)	35	10-1	7.9 - 3.2	4	<	• #	2	1.	•	:>	•	c	,
Ambal Cantral Java (und)	00	0-6	7.8 - 3.5	45	<	Ω, I	• {		•	ž		: c:	S
Puriodi, Cuiuci vara (muo)	~	67 - 20	7,6 - 3.6	41	<	m	a	_ ر	•		•	: 2	, ,
Bangkalan, Mauma (Busse)	- 100	6 · 6	7.9 - 3.8	87 77	•		Ω		•	N.	•	4 C	4
Kaligesing, Celluar Java (iat)	¥.	8.2	6.7 - 3.2	48	•	•	A	. )	•	5.)	4	4 0	) - (
Kramatwatu, west Java (Jat)			6.7 - 3.3	49	<	ı	•	,	•	×	1	<i>.</i>	
Jakarta (Jat)			7.6 - 3.9	51	•	സ്	A	1	•	•	t	• ព	
Magetan, East Java (Jat)	1050	4.9	7.2 - 3.7	5	A	മ	വ	* * *	•	ı	•	< c	3
Dingovan, East Java (lat)		0-7	7.5 - 3.8	2	•	1	<b>1</b>	•	•	•	ı	ς ς	
Puspo, East Java (lat)	052		75-3.8	51	A	•	1	1	r	•	•	۲.	•
Magelang, Central Java (lat)			75.39	52	1	ı	•	۲.1		1	ı	• •	
Wingi, East Java (lat)	3	4 r • c		2	A	,	•	<u>ب</u>	٠	•	•	: <b>-</b> ,	•
Mendut, East Java (?)	/ 57	2 I		. V	. 4	,	•		ı	•	•	с <u>к</u>	•
Tumpang, Central Java (lat)	<u>8</u>	£ - 2	0.4 - 0.0	2.5	< <	. 1	,		,	,		1	s
Blitar, East Java (Lat)	165	5-1	0./ • 4./	3 5	<		•	•	N.a		•	•	s
Kediri, East Java (?)	62	2-2	0./-4.2	3 3	٢			Ţ	Ma	٠	,	•	•
Sawahan, East Java (?)	570	7-3	7.1 - 4.0	3 3	1	L		} 1	Ma	•	,	•	Ś
Kanigoro, East Java (Marg)	20	7.3	6.6 - 4.5	8 (		•	•		M <sup>2</sup> +**	٠	•	•	•
Phumbon. West Java (Marg)	17	ς - τ.	6.4 - 4.4	3	∢		ı		****		•	,	•
Runoodua West Java (Marg)	15	7-3	6.5 - 4.5	69	•	1	•	• •		•	,	•	•
Nominit Fast Java (?)	103	7-3	6,1 - 4.7	76	1	•	•	2	240		•	•	•
Kawedan East Java (?)	220	7-3	6.5 - 4.9	22	•	,	•	•	No.	• •	•	,	•
I finme Pandane South Sulawesi (Marg)	•••	6-4	6.0 - 4.8	<u>S</u>		•	•	,		ı	,	•	•
Nounith Fast Java (Marc)	3	7-3	6.0 - 5.1	3	•	ł	•	•	A	•	•	1	•
Demokrason Madrira Marco)	15	7-3	6.0 - 5.3	8	1	•	•	• •	1VLG	1			•
11. autoromut Tear Java (?)	10	א. 4	5.2 - 5.9	113	ŀ	•	•	1	TN.	1	•		1
WINDINGLA LANUARY	 ` ~	5-4		125	•	٩	•	•	R.N.	,	•		
Probalization Part (1919 March	10	5-4	4.9-6.3	129	•	,	٠	• .	Ma	۰	•	•	
Frooutinged, there are drive by	ν.	4 - ]	4.3 - 5.7	132	<	•	•		Na Na	•	•	•	
Burnane, Timor (Mare)	(1	4-6	4.2 - 7.2	171	٠	•	,	٠	N.A	•	•	•	

 $T_able$  B-2-3 Distribution of Target Fruits over Various Centres (2/2)

Resources : Terra, GJA (1952); Some Ecological Requirements of Indonesian Fruit Tr

No extreme dry monthy, irregular, misty climate
 Irrigued for mangesteen and lanzon.
 Regular culture proved to be impossible under local conditions
 \*\* Speculal growing conter

Growing Centers of Six Targert Fruits in Indonesia
Table B-2-4

			Elevation	Number	ber	Averag	Average Length	
Commodity	Recion	Province	(m above sea level)	Wet month	Dry month	Wet month	Dry month	Quotient
Darren Cree Wichel	Sukahumi	West Java	600	00	0	8.9	1.9	50
Banana, Urus IMIGUEI	Dinoc	East Java	640	6	C1	7.5	3.8	51
Dunan	r upo		1	ſ	. ۲	64	4	69
Mango	Plumbon	West Java	21	- r	יז ני ייז ני	2.2	4.5	69
	Bangoduo	West Java	2 2	- ٢	5 C	C Y	۲. ۲.	88
	Pamekasan	East Java	ŭ	- I	• د	) <b>(</b>	0 V	
	Wingongan	East Java	10	<u>0</u>	4	4.0		
	Pasuruan	East Java	ŝ	S	Ś	4		() () ()
	Probolineco	East Java	10	S	é	4.9	20	77 I
Colol.	Temnal	Central Iava	500	6	0	8.7	53 53	
Salak	Dereleder	Contain and	- <b>L</b>	~	6	7.6	3.6	47
	DangKalati	Trave Java					r <	<b>۲</b>
Rambutan	Biniai	North Sumatra	28	13	0	10.5	~~~	- 4
	L'ho'Nea	D.I. Aceh	0	12	0	8.7		Q :
	Pasar Mineril	D.K.I. Jakarta	53	10	-	7.9	C.1	4
	Denole	West Java	95	12	0	9.6	0.1	0
	reput	East Java	050	7	ę	7.2	3.7	51
	SINEOSALI	בנואנ ומשל					c	0,
Mangosteen	Kaligesing	Central Java	100	6	3	6./	0.0	¢ t

Source: G.J.A.Terra

B - 27

District/ sub-District	Fruit	Arca (ha)	Elevation (m)	Climate Type* Number of Wet and Dry months	Topography	Slope (%)	Soil Type
Langkat Binjai	Ramoutan	500	0;	A2 type (10-0)	Plain	0-3	Andosol, Regosol, Alluvial, and Yellow red podzolic
Karo Simpang Empat	Marquisa	1,000	0001-008	A <sub>2</sub> type (7-0)	Flat, undulating, rolling, and hilly	15-40	Andoso! and Yellow red podzolic
Dairi Siempatnempu	Durian	50	100-500	A2 type (10-0)	Flat, undulating, rolling to hilly	2-30	Yellow red podzolic
Silima Pungga-Pungga Siempatnempu Hilir Tiga Lingga	Durian Durian Durian	800 800 800 800 800 800 800 800 800 800	300-700			3-5 80	
Tapanuli Utara Garoga	Mangosteen	500	400-700	A2 type (10-0)	Flat, undulating, rolling to hilly	040	Podzolic, Regosol and Lithosol
Garoga Pahae Julu	Durian Durian	300 100	400-500			2-40	Alluvial, Latosols, Podzolic, Regosol, and Lithosol
Pahae Jac	Durian	100				040	
Tapanuli Tengah Sorkam Lumut Sioabangun	Durtan Durtan Durtan	250 250	100-200 2-15	A, type (12-0)	Plain Plain to undulating	0-13 0	Yellow red podzolic
Tapanuli Selatan Batang Natal	Mangosteen	800	400-700	B <sub>2</sub> type (7-2)	Flat, undulating, rolling to hilly	0-25	Alluvial, Latosols, Organosol Regosol, Grumusol, Yellow red
Siais Padang Sidempuan Barat Padano Sidempuan Timur	Salak Salak Salak	2000 2000 2000	300-500 300-600 250-600				podzolic and Lithosol
* Schmidt and Fergusson method.	method.						
The method divided into 6 types of climates : 1. A, type or wet climate, which has 12 wet months and 0 dry months 2. A <sub>2</sub> type or wet enough climate, which has less than 12 wet months and 0 dry months 3. B <sub>1</sub> type or wet half climate, which has 7-8 wet months and 1-2 dry months 4. B <sub>2</sub> type or dry wet half climate, which has 7-8 wet months and 2-4 dry months	res of climates : ch has 12 wet m ate, which has le which has 9-10 late, which has 7	onths and 0 ss than 12 v wet months -8 wet month	dry months wet months and and 1-2 dry mo ths and 2-4 dry	0 dry months onths months	<pre>&gt; wet climate without dry month &gt; wet climate with dry season</pre>	month son	LOCOGREEDEX 20022 LIVELED plain 0-3 % 0- 5 m undulating 3-8 % 5- 15 m rolling 8-15 % 15- 50 m hilly 15-30 % 50-200 m mountainous >30 % >200 m

Table B-4-1 Agro-ecological Condition in North Sumatra Province

The method divided into 0 types of cumates: 1. A, type or wet climate, which has 12 wet months and 0 dry months 2. A<sub>2</sub> type or wet enough climate, which has less than 12 wet months and 0 dry months 3. B<sub>1</sub> type or wet half climate, which has 9-10 wet months and 1-2 dry months 4. B<sub>2</sub> type or dry wet half climate, which has 5-8 wet months and 2-4 dry months 5. C type or dry enough climate, which has 5-6 wet months and 6 dry months 5. C type or dry climate, which has 3-4 wet months and 6-8 dry months

dry climate has more than 4 dry months

Bager Capacing         Durinan         500         150-700         A, type (1-0)         Rolling to hilly         15-30         Latosols           Bandung         Colenengka:         Avocado         500         150-700         B, type (1-1)         Flut, rolling to hilly         15-30         Latosols           Bandung         Colenengka:         Avocado         500         200-400         B, type (1-1)         Flut, rolling to hilly         15-30         Regosol, and Yellow red polyolic, and Regosol, and Yellow red polyolic, and Random           Tashimabaya         Salak         200         200-400         A, type (12-0)         Undulating to rolling         15-30         Regosol, and Yellow red polyolic, and Regosol, and Yellow red polyolic, and Random           Kawalu         Salak         200         100-350         B, type (2-3)         Flat to undulating to rolling         15-40         Latosols           Clemmas         Salak         200         25-100         B, type (7-3)         Flat to undulating to rolling         15-40         Latosols           Clemmas         Salak         200         25-100         B, type (7-3)         Into undulating to rolling         15-40         Latosols           Clemmas         Salakdama         Salakdama         25-100         A, type (7-3)         Intoundulating to rolling<	District/ sub-District	Fruit	Area (ha)	Elevation (m)	Climate Type* Number of Wet and Dry months	Topography	Slope (%)	Soil Type	
Bit     Avocado     500     600-1000     B; type (11-1)     Flat, rolling to hilly     15-30     Alluvial       wm     Salak     500     200-400     A, type (12-0)     Undulating to rolling     15-30     Regosol, and Yellow red pod Latosol, Yellow red pod Regosol       wm     Salak     200     100-350     B; type (12-0)     Undulating to rolling     15-30     Regosol, and Yellow red pod Latosol, Yellow red pod Regosol       mm     Salak     200     100-350     B; type (7-3)     Rolling     15-40     Latosols       mm     Salak     200     25-100     B; type (7-3)     Flat to undulating     0-15     Crumusol, and allovial       %     Mango     530     25-100     B; type (7-3)     Flat to undulating     0-15     Crumusol, and allovial       %     Mango     530     25-100     B; type (7-3)     Flat to undulating     0-15     Crumusol, and allovial       %     Mango     470     25-100     B; type (7-3)     Flat to undulating     0-15     Crumusol, and allovial       %     Mango     470     25-100     B; type (7-3)     Flat to undulating     0-15     Crumusol, and allovial       %     Mango     470     25-100     B; type (7-3)     Undulating     0-15     Crumusol, and allovial <td>Bogor Cigndeg</td> <td>Durian</td> <td>500</td> <td>150-700</td> <td>A<sub>5</sub> type (11-0)</td> <td>Rolling to hilly</td> <td>15-30</td> <td>Latosols</td> <td><u></u></td>	Bogor Cigndeg	Durian	500	150-700	A <sub>5</sub> type (11-0)	Rolling to hilly	15-30	Latosols	<u></u>
Jayya     Salak     500     200-400     A <sub>1</sub> type (12-0)     Undulating to rolling     15-30     Regessol, and Yellow red pocholic       nin     Salak     300     200-400     A <sub>1</sub> type (12-0)     Undulating to rolling     15-30     Regessol, and Yellow red pocholic       nin     Salak     200     100-350     B <sub>2</sub> type (8-2)     Rolling     15-40     Latosols       name     Duku     500     100-350     B <sub>2</sub> type (7-3)     Rolling     15-40     Latosols       name     Duku     500     25-100     B <sub>2</sub> type (7-3)     Rolling     0-15     Grumusol, and alluvial       name     Duku     500     200-600     A <sub>1</sub> type (12-0)     Undulating to rolling     0-15     Grumusol, and alluvial       name     Mango     500     200-600     A <sub>1</sub> type (12-0)     Undulating to rolling     0-15     Grumusol, and alluvial       nat     Mango vector     500     400-600     A <sub>1</sub> type (12-0)     Undulating to rolling     0-15     Indulating to rolling     0-15       nat     Mango vector     500     400-600     A <sub>1</sub> type (12-0)     Undulating to rolling     0-15     0     10-15       syste     Mango vector     500     400-600     A <sub>1</sub> type (12-0)     Undulating to rolling     0-15     0	Bundung Cicalengka	Avocado	200	0001-009	B; type (11-1)	Flat, rolling to hilly	15-30	Alluvial	
In     Salak     200     100-350     B <sub>2</sub> type (8-2)     Rolling     15-40     Latosols       Ina     Duku     500     100-350     B <sub>2</sub> type (7-3)     Flat to undulating     0-15     Crumusoi, and alluvial       Ing     Mango     530     25-100     B <sub>2</sub> type (7-3)     Flat to undulating     0-15     Crumusoi, and alluvial       Ing     Mango     470     25-100     B <sub>2</sub> type (7-3)     Flat to undulating     0-15     Crumusoi, and alluvial       Ingva     Mangosteen     500     400-600     A <sub>1</sub> type (1-0)     Undulating to rolling     15-40     Latosols       Indt     artu     Mangosteen     500     400-600     A <sub>1</sub> type (12-0)     Undulating to rolling     15-40     Latosols       Indt     artu     Mangosteen     500     400-600     A <sub>1</sub> type (12-0)     Undulating to rolling     15-40     Latosols       Indt     artu     Mangosteen     500     400-600     A <sub>1</sub> type (12-0)     Undulating to rolling     15-40     Latosols       Indt     artu     Mangosteen     500     400-600     A <sub>1</sub> type (12-0)     Undulating to rolling     15-40     Latosols       Indt     Indt     Indt     Indt     Indt     Indt     Indt     Indt       Tope	Tusikmalaya Cibeureum Manonjaya	Sulak Salak	300	200-400	A <sub>1</sub> type (12-0)	Undulating to colling	15-30	Regosol, and Yellow red podzolic Latosol, Yellow red podzolic, and Regosol	
ana     Duku     500     100-350     B <sub>2</sub> type (3-2)     Rolling     15-40     Latosols       ng     Mango     530     25-100     B <sub>2</sub> type (7-3)     Flat to undulating     0-15     Crumusol, and alluvial       ng     Mango     470     25-100     B <sub>2</sub> type (7-3)     Flat to undulating     0-15     Crumusol, and alluvial       ngva     Mango     470     25-100     B <sub>2</sub> type (7-3)     Flat to undulating     0-15     Crumusol, and alluvial       ngva     Mango     470     25-100     B <sub>2</sub> type (7-3)     Flat to undulating     0-15     Crumusol, and alluvial       nartu     Mango     470     25-100     B <sub>2</sub> type (7-3)     Undulating to rolling     15-40     Latosols       artu     Mangosteen     500     400-600     A <sub>1</sub> type (12-0)     Undulating to rolling     15-40     Latosols       yasa     matu     ered divided into 6 types of climates :     500     400-600     A <sub>1</sub> type (12-0)     Undulating to rolling     15-40     Latosols       over ere over the over the set than 12 wet months and 0 dry months     50     50     50     50%       type or wet enough climate, which has 12 wet months and 2-4 dry months     wet climate with dry setson     51     50%       type or dry wet half climate, which has 2.8 wet months	ulewah	Salak	200						
a     Mango     530     25-100     B, type (7-3)     Flat to undulating     0-15     Grumusol, and alluvial       a     Mango     470     25-100     B, type (7-3)     Flat to undulating     0-15     Grumusol, and alluvial       a     Mango     470     25-100     B, type (7-3)     Flat to undulating     0-15     Grumusol, and alluvial       a     Mangosteen     500     400-600     A, type (12-0)     Undulating to rolling     15-40     Latosols       a     Mangosteen     500     400-600     A, type (12-0)     Undulating to rolling     15-40     Latosols       a     od divided into 6 types of climates :     500     A, type (12-0)     Undulating to rolling     15-40     Latosols       a     od divided into 6 types of climates :     50     400-600     A, type (12-0)     Undulating to rolling     5-3%       a     od divided into 6 types of climates :     50     50     5-3%     50%       c or wet enough climate, which has 9-10 wet months     50     5-30%     50%	Ciamis Sukadana	Duku	200	100-350	B2 type (8-2)	Rolling	15-40	Latosols	
A     Mangosteen     500     400-600     A <sub>1</sub> type (12-0)     Undulating to rolling     15-40     Latosols       t     and Fergusson method.     and Fergusson method.     0-3 %     0-3 %       d divided into 6 types of climates :     or wet climate without dry month     0-3 %     0-3 %       or wet climate, which has less than 12 wet months and 0 dry months     a wet climate without dry month     3-8 %       or wet shuft climate, which has 72 wet months and 0 dry months     a wet climate with dry season     15-50 %       or dry wet half climate, which has 78 wet months     3-4 dry months     15-50 %       or dry wet half climate, which has 78 wet months     3-4 dry months     15-50 %	Sumedang Tomo Ujungjaya	Mango Mango	530 470	25-100 25-100	B <sub>2</sub> type (7-3) B <sub>2</sub> type (7-3)	Flat to undulating	0-15	Grumusol, and alluvial	
es : Topography Slope et months and 0 dry months as less than 12 wet months and 0 dry months as less than 12 wet months and 0 dry months as 12 dry months as 7.8 wet months and 2.4 dry months as 7.8 wet climate with dry season hilly 15 - 50 % mountainous > 30 %	Purwakarta Wanayasa	Mangosteen	200	400-600	A1 type (12-0)	Undulating to rolling	15-40	Latosols	
i.opcostrapity     stope       plain     0 - 3 %       plain     0 - 3 %       wet climate without dry month     undulating     3 - 8 %       rolling     8 - 15 %     nilly       wet climate with dry season     hilly     15 - 50 %       mountainous     > 30 %	* Schmidt and Fergusson	n method.							
	The method divided into 6 typ 1. A <sub>1</sub> type or wet climate, whi 2. A <sub>2</sub> type or wet enough clim 3. B <sub>1</sub> type or wet half climate, 4. B <sub>2</sub> type or dry wet half climate,	pes of climates : iich has 12 wet mo nate, which has les i, which has 9-10 v nate, which has 7-	mths and 0 d is than 12 we vet months a 8 wet month	lry months et months and C ind 1-2 dry mor is and 2-4 dry n	) dry months aths Aconths	<pre>&gt; wet climate without dry r &gt; wet climate with dry sear</pre>	nonth son	3.000 0-3 % 3-8 % 8-15 % 15-30 % us	1 E E E E E E

Table B-4-2 Agro-ccological Condition in West Java Province

A<sub>2</sub> type or wet enough climate, which has less than 12 wet months and 0 dry month
 B<sub>1</sub> type or wet half climate, which has 9-10 wet months and 1-2 dry months
 B<sub>2</sub> type or dry wet half climate, which has 7-8 wet months and 2-4 dry months
 C type or dry enough climate, which has 5-6 wet months and 6 dry months
 D type or dry climate, which has 3-4 wet months and 6 dry months

} dry climate has more than 4 dry months

				<u> </u>		
Soil Type	Latovol	Alluvial Alluvial	Latosols, Mediterranean, and Lithosol	Alluvial, Mediterranean and Regosol	Alluvial, and Mediterranean Alluvial and Mediterranean	Regosol Regosol and Gleysol Regosol Latosol and Regosol Mediterranean, Latosol and Regosol Regosol and Mediterranean Latosols
Slope (%)	12.40 15.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40 12.40	0-2	15-40	0-15	00 97	0-2 0-2 15-40 15-40 2-15 2-15 2-15
Topography	Hilly to mountainous Hilly to mountainous Plain Plain Plain	Plain Plain	Hilly to mountainous	Flat to undulating Flat to undulating Hilly to mountainous	Plain Plain	Ptain Plain Plain Hilly Hilly Rolling Rolling Rolling
Climate Type Number of Wet and Dry months	B2 type (6-4) C type (6-5)	B2 type (6-3)	A2 type (9-1)	B2 type (7-4)	D type (5-7)	B <sub>2</sub> type (8-3)
Elevation (m)	600-700 400-500 23 28 60 46	25-100 25-100	300-900	300-400 100-500 500-1500	0-25 0-25	10-20 20-25 20-25 200-200 100-200 100-200 100-200
Area (ha)	1.000 150 150 150 150 150	000 000 000	1,000	400 00000	375 375	00000000000000000000000000000000000000
Fruit	Durian Durian Banana Banana Banana Banana	Duku Duku	Durian	Salak Salak Salak	Mango Mango	Burrarna Burrarna Burrarna Burrarna Avocado Avocado Avocado
District/ sub-District	Jombang Wenosalam Barens Kesamben Sumobito Diwek Tembelang	Tulungungung Ngatru Kedungwaru	Trenggalck Bendungan	Malang Gondang Logi Bululawang Tujinan	Pasuruen Grati Nguling	Lumajang Yosowolangur Tokung Kunir Senduro Klakah Runyoso Randungung

Table B-4-3 Agro-ecological Condition in East Java Province

\* Schmidt and Fergusson method.

The method divided into 6 types of climates : 1. A, type or wet climate, which has 12 wet months and 0 dry months 2. A<sub>2</sub> type or wet enough climate, which has 9-10 wet months and 1-2 dry months 3. B<sub>1</sub> type or wet half climate, which has 9-10 wet months and 1-2 dry months 4. B<sub>2</sub> type or dry wet half climate, which has 7-8 wet months and 2-4 dry months 5. C type or dry enough climate, which has 5-6 wet months and 6 dry months 6. D type or dry climate, which has 3-4 wet months and 6-8 dry months.

,		<u>Topography</u> plain	<u>Slope</u> 0 - 3 %	Height. 0 - 5 m
~~	wet climate without dry month	undulating	3 - 8 %	5 - 15 m 15 - 50 m
~~	wet climate with dry season	roung hilly moustairous	> 30 %	5-30% 50-200 m > 30% > 200 m
~~~	dry climate has more than 4 dry months			

District sub-District	Fruit	Area (ha)	Elevation (m)	Climate Type* Number of Wet and Dry months	Topography	Slope (%)	Soil Type
iMaros Tanralili	Mango	500	50-150	B <sub>2</sub> type (7-4)	Plain to undulating	0-2	Latosols, Mediterrancan, Andosol and Lithosol
Gowa Tompobulu Tompobulu Tinggi Moncong	Marquisa Avocado Avocado	1,000 150 200	1,000-1,200	B2 type (8-2)	Hilly to mountainous	20-40	Lutosols, and Mediterranean Latosols, Mediterranean, and Yellow red podzolic
Parangloe	Avocado	150					
Bone Patinpeng	Mango	500	001-0	B2 type (7-4)	Plain	0-2	Mediterrancan
Wajo Pemmana/S.Paru	Mango	\$00	25-50	B2 type (8-2)	Rolling to hilly	8-30	Mediterranean, Grumusol and Alluvial
Sidenreng Rappang Panca Rijang	Mango	200	0-500	B2 type (6-2)	Plain to rolling	0-15	Alluvial, Regosol and Yellow red podzolie
Soppeng Manoiwawo Manonawa	Avocado Avocado	250 250	60-200	A1 type (12-0)	Rolling to hilly Rolling to hilly	0-15 16-25	Regosol, Mediterranean and Lithosol Mediterranean
Enrekang Meiwa	Rambutan	200	165	A1 type (12-0)	Undulating	10-15	Podzolic and Mediterranean (PH 5-6)
Tana Toraja Mengkendek Saluputti Rindinzallo	Mangosteen Marquisa Marquisa	500 2,000 1,000	300-800 800-1500	A2 type (9-0) B1 type (9-1)	Rolling to hilly Hilly to mountainous	10-15 15-30	Yellow red podzolic Yellow red podzolic Yellow red podzolic
* Schmidt and Fergusson method.	ı method.						:
The method divided into 6 types of climates : 1. A <sub>1</sub> type or wet climate, which has 12 wet months and 0 dry months 2. A <sub>2</sub> type or wet enough climate, which has less than 12 wet months and 0 dry months 5. B <sub>1</sub> type or wet half climate, which has 9-10 wet months and 1-2 dry months	es of climates : ch has 12 wet mo ate, which has les which has 9-10 v	nths and 0 d s than 12 we vet months a	ry months at months and 0 nd 1-2 dry mon	dry months ths	<pre>} wet climate without dry month     wet climate with dry season</pre>	dry month season	0420
4. B <sub>2</sub> type or dry wet half climate, which has 7-8 wet months and 2-4 dry months 5. C type or dry enough climate, which has 5-6 wet months and 6 dry months	ate, which has 7-1 te, which has 5-6	8 wet month wet months	s and 2-4 dry mont and 6 dry mont	suno. hs	And aliveste has more than 4 dry	than 4 drv	ntainous > 30 %

Table B-4-4 Agro-ccological Condition in South Sulawesi Province (1/2)

A<sub>1</sub> type or wet climate, which has 12 wet months and 0 dry months
 A<sub>2</sub> type or wet enough climate, which has less than 12 wet months and 0 dry months
 B<sub>1</sub> type or wet half climate, which has 9-10 wet months and 1-2 dry months
 B<sub>2</sub> type or dry wet half climate, which has 7-8 wet months and 2-4 dry months
 C type or dry enough climate, which has 5-6 wet months and 6 dry months
 D type or dry climate, which has 3-4 wet months and 6-8 dry months

4 dry climate has more than 4 dry

Table B-4-4 Agro-ecological Condition in South Sulawesi Province (2/2)

District/ sub-District	Fruit	Area (ha)	Elevation (m)	Climate Type* Number of Wet and Dry months	Topography	Slope (%)	Soil Type
Polewali Mamasa Mambi	Mangosteen	500	400-600	A1 type (12-0)	Rolling to hilly	10-30	Mediterrancan
Majene Sendana	Mango	500	40-50	B <sub>2</sub> type (7-3)	Rolling to hilly	5-30	Mediterrancan
Mamuju Kalukku Budong-Budong	Rambutan Rambutan	1,000 1,350	5-500	B <sub>1</sub> type (10-1)	Flat to rolling	10-20	Alluvial, Podzolic and Grumusol (PH 5.5)
Pinrang Patampanua Duampanua	Rambutan Rambutan	300 200	100-150	B, type (10-0)	Undulating Rolling	5-15	Alluvial, Regosol and Podzolic Alluvial and Podzolic
Barru Tanete Rilau Tanete Riaja	Rambutan Rambutan	200 500	100-300 400-600	B2 type (7-3)	Flat to undulating Rolling to hilly	5-10 10-20	Regosol and Alluvial Regosol
* Schmidt and Fergusson method.	method.						
The method divided into 6 types of climates : 1. A <sub>1</sub> type or wet climate, which has 12 wet months and 0 dry months 2. A <sub>2</sub> type or wet enough climate, which has less than 12 wet months and 0 dry months 3. B <sub>1</sub> type or wet half climate, which has 9-10 wet months and 1-2 dry months 4. D <sub>1</sub> type or dry use half climate which has 7-8 wet months and 2-4 dry months	s of climates : h has 12 wet mo te, which has les: which has 9-10 w	nths and 0 d s than 12 we ret months a t wet month	ry months at months and 0 nd 1-2 dry mon s and 2-4 dry m	dry months ths onths	<pre>&gt; wet climate without dry month &gt; wet climate with dry season</pre>	ıt dry month lry season	81076 3 - 5 % 5 - 15 % 5 - 50 % 50
c. σ true or dat and the plimate which has 5-6 wet months and 6 dry months	which has 5-6	wet months	and 6 drv month	st			mountainous $> 30\%$ $> 200$ m

A<sub>1</sub> type or wet climate, which has 12 wet months and 0 dry months
 A<sub>2</sub> type or wet enough climate, which has less than 12 wet months and 0 dry months
 B<sub>1</sub> type or wet half climate, which has 9-10 wet months and 1-2 dry months
 B<sub>2</sub> type or dry wet half climate, which has 5-6 wet months and 2-4 dry months
 C type or dry enough climate, which has 5-6 wet months and 6 dry months
 D type or dry climate, which has 3-4 wet months and 6-8 dry months

dry climate has more than 4 dry

Operation	Year	Apr.	May	Jun.	Jul.	Aug.	Scp.	Oct.	Nov.	Dee.	Jan.	Feb.	Ma
Non Bearing Tree					L				L		L		
1. Planting													
1.1 Variety:													
<ul> <li>Ijo panjang (long green)</li> </ul>													
- ljo bunder (round green)													
1.2 In the beginning of rainy								*					
season. Or any time if there	is												
available economically wate			į										Í
to be watering													
1.3 The young tree needs shadir							··			h		<b> </b>	
and watering if no rain	15		1	ļ	{								
		i i									ļ		
(3-5 liter/tree/day)											<u> </u>	+	<u> </u>
2. Fertilization					<b> </b>			*					┨
2.1 Soil conditioner								•		Ì			
If soil pH below 5.5 adjust										ļ			
with lime at rate of 2.5-3.5													1
ton/ha; at least each 5 years			<b> </b>	_	<b> </b>	<b> </b>				<b> </b>	<b></b>	<b> </b>	┣
2.2 Organic manure (per tree)		I	I	1									1
First application as basic		I		1	1					i	ļ	I	1
fertilization in planting time	;	I		1	l								1
the next will be in rainy													
scason						1							
2.2.1 40 kg farmyard man	ire l	[		[	[	1		*	I	[	<u> </u>		Γ
50 kg farmyard mam				1			ļ			*			
80 kg farmyard man										*			
90 kg farmyard man					!					*			i i
2.3 Inorganic fertilizer (per tree		1	1		<u> </u>	<b>_</b>		<u> </u>		1		<u> </u>	<b>†</b>
Twice a year at the beginning													
and the end of rainy season													
2.3.1 Urea 110 g				+		†	*	<b>†</b>	· · · · · · — ·	<b>+</b>	<u>+</u>	<u> </u>	
150 g	2						*						
							*						
200 g	3					1							
250 g	4			<b></b>	-				<b>[</b>		+	┇	
2.3.2 TSP 250 g				1			*						'
300 g	2	2					*	1		]		1	1
400 g	2	3					*					Í	1
500 g	4	<u>اا</u>	$\vdash$	<b>_</b>		<u>  </u>	+	<b> </b>	<b> </b>	<b>_</b>		<b>_</b>	<b></b>
2.3.3 KCl 100 g	1	1	1		1		*			1		1	
100 g	2	2	1	1			*		1	1	1		1
150 g	-	3	1			1	*	1		1			
200 g	4	1	1		.1		*	1	1		1		1
3. Irrigation			T		1	1	1	<b>_</b>	1			1	1
If no rain the tree needs watering	z			1		1		1	1				
20-25 liter/tree/day	Ş		1	1				1			1	1	
3.1 Dry season		-	•	+	-	1	1	<b>h</b>	+	+	+	+	1
3.2 Rainy season		<u> </u>		-†	1		┤──			1	1		1
4. Pest control (each year)		+	+	*	1		+	<b>F</b> *	+			*	-†
								1	1	1	1	1	
Spray with insecticide and						1		1		1		1	
fungicide to control/to prevent s		1	1					1	1	1			
borer, antraenosa, cancer, rootro	et 🛛	1	1	Ì			1	1					
etc.									<u> </u>		_		$\perp$
5. Other operations		_	<b>_</b>	_	-	<b>_</b>							1
5.1 Soil under the crown has to	) be	1		*		1		*			1	*	
chopped													
5.2 Dry and dead twig has to b	e		1	*	Τ		T	*		1	T	*	T
prunned and burnt			1	Í	1		Í						
province on a Count		1	1		1	1	1	1	1	1	1	1	

# Table B-4-5 Avocado Management Calendar (1/2)

	Operation		Year	Apr.	May	10D.	101.	Aug.	sep.	Oct	Nov.	Dee.	Jan.	Feb.	Ma 
	ng Tree						L				·				ļ
	ilization					<b> </b>					L	ļ	ļ		L_
1.1	Soil conditions					1									
1	After 5 years ap	ply second	5												ŀ
	liming at the rat	ied 2.5-3.5	6							*					
	ton/ha in the rai	ny season	7												
			8		1										
			9												
			10												
1.2	Organic manure	(per tree)							<b>[</b>						
	Apply once a ye						1								
	season	•												1	
		armyard manure	5				[	1		*		1			Γ
		armyard manure	6							*					
		armyard manure					i i			*		Í			
		armyard manure	7 S							*					
		armyard manure	9						1	*					
		armyard manure	10							*					
13	Inorganic fertili						1	1				1	1	<u> </u>	1
•	Twice a year, in					1	ł				1				
	and the end of r														
	1.3.1 Urea	1110 g	5		1	<u> </u>	<b></b>		*	†	<b>-</b>		1	• · · · ·	
	listi oltu	1250 g	6				1		*						
		1350 g	7			1			*	ļ				Í	;
		1500 g	8						*	1					<b>,</b>
		1600 g	9						*						,
		1700 g	10						*			1			
	1.3.2 TSP	1600 g	5			1			*	†		<u> </u>	+	<u>†</u>	<u>†</u> ;
	1.5.2 151	1600 g	6						*		1				<b>,</b>
		1600 g	7						*						<b>,</b>
		1600 g	8		1	1			*			Į	1		
		1600 g	9					í	*						1
			10						1 *		1				
	1.3.3 KCI	1600 g 2000 g	5		+				*						+
	1.3.3 KG	•							*						
		2000 g	6	4		ļ						1			
		2000 g	7			1									
		2000 g 2000 c													
		2000 g	9 10							1			1		
		2000 g	I	' <u> </u>	+	+		+	+	+					
	gation														
	nilar to the nonbe	anng plant			+			-							
	Dry season	<u></u>			—		+-				╂				┢
	Rainy season					*		+		<b>4</b>			-	+	$\pm$
	st control					1				1		1	1	1	
	nilar to the non b	earing plant	· · · · · · · · · · · · · · · · · · ·	+		+	+		· <b> </b>	*		- <b> </b>	+	+	
	her operation					1				1	1		i i	*	
	milar to the non b	waring plant		+	––		_					_		–−	+
	rvesting			+	+		+-	+				<u> </u>	+		+
5.1	Flowering sea	son, fruit setting		1		ļ	1		1	1	-			1	
	and maturity	<u> </u>								1	<b>_</b>			+	_
5.2	P Harvesting sea	ารอก						1					1	₩-	+
				I	1					1		<u> </u>			1

## Table B-4-5 Avocado Management Calendar (2/2)

Operation	Year	Apr.	May	Jun.	Jal.	Aug	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mai
Planting													
1.1 Variety:													
- Cavendish							1						
- Horn plantation (Pisang agun	g)		·					*			• ··· ··	<b>↓</b>	<b>!</b>
1.2 In the beginning of rainy													
season. Or any time if there is											1		
available economically water								1					
to be watering 1.3 The young tree needs shading				<u> </u>								1	ļ
and watering if no rain													
(3-5 liter/rec/day)			ļ										
Fertilization							f				1		
2.1 Soil conditioner						· · /- •		*			1	1	
If soil pH below 5.5 adjust													
with lime at rate of 2.5-3.5							1						
ton/ha; at least each 5 years													
2.2 Organic manure (per tree)				1			[						
First application as basic													
fertilization in planting time;			1			1	1					1	
the next will be in rainy					1								
season			ļ	<b> </b>	<b> </b>	ļ	<u> </u>	<b> </b>			<b>_</b>	<u> </u>	
2.2.1 40 kg farmyard manure		1					1	*					
40 kg farmyard manure		1								1			
40 kg farmyard manure	3		ļ	I—-					<b> </b>	<b>.</b>	<b> </b>		1—
2.3 Inorganic fertilizer (per tree)			1										
Twice a year at the beginning						1							
and the end of rainy season			<u> </u>		–		+			╂		-+	+
2.3.1 Urea 75 g	1												
375 g	2					1			+				
500 g			+			•	-1	+	*				
2.3.2 TSP 50 g		2		1		1				ļ	•		
100 g		ŝ								1			
100 g 2.3.3 KC1 50 g		<u>'</u>	·			+	-		*	+	-	1	1
150 g		2							*				
250 g		3				1	1	1					
. Irrigation		+	1	1	1	1	1		1	1	-		
If no rain the tree needs watering											1	1	
20-25 liter/tree/day					1						<u> </u>		
3.1 Dry season		-					1-1					_	-
3.2 Rainy season								-					- <b> </b>
Pest control (each year)				1						<u> </u>	4	$\perp$	
4.1 Control for banana weevil, sci		1		*			1		1			1	
moth, rust thrips, aphid and le			_	-	-		_				<b>_</b>		
4.2 Banana weevil cultural contro	lby			1					*				
destroying the sheltering and		1											
feeding places (pseudostem)		_			+							_{	- -
4.3 Banana cocevil trapping conti	101				+				- <u> </u>	-+		-+	+
6. Other operations			+		*				+ +				╞
5.1 Weeding		+			-   - <del>-</del>					-1	+		-ļ-
5.2 Desuckering every 4 months		-+	*				*		+	-†	-+	-1	1-
5.3 Propping serves to protect bearing plants													
5.4 Bagging of bunches		-1	+ +	-1	1	-1			-+	-1	*	-1	
5.5 Removal of the male bud			+	+	+-		*		<u> </u>	-1	•		
5.6 Waste harvested pseudostem	mav			-1	•	- <b>†-</b>	1	-1	+	1	1	-1	
be collected at other place to		-						1		1			
composted and later used as						l							
organic matter						ļ			1				
5. Harvesting		-†	1	1	-†	1	1	-	1	1			
6.1 Every 4 months for 3 years in	a July.	1	1	1	-1		-		1		1		7
November and March		2				•			+				
properties and rearest		3 .				•			*			1	
					•	1	1		1	L	1	E	

.

### Table B-4-6 Banana Management Calendar

A. Non Rearing Tree       Image: Second	(	Operation	Year	Apr.	May	Jun.	Ju).	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar,
1. Planing	A. Non Bea	aring Tree			***** <b>*</b> *******			<u>`</u>							
1.1       Varies:       -         -       Pdembag       -         12       In the beginning of rainy scason. Or any time if there is available economically water       -         13       The young tree needs shading and watering if no rain (-1-5 thertree/day)       -         2.       Fertilization       -         2.1       Sele conditioner       -         14       Freilization       -         2.1       Sele conditioner       -         15       they they they solution       -         2.1       Sele conditioner       -         15       they they solution       -         16       Stage solution       -         17       solution       1       -         18       Sele farmy and manue       -       -         19       Stage farmy and manue       -       -         20       Stage farmy and manue       -       -         23       Inorganic ferilizer (per tree)       -       -         10       Stage farmy and manue       -       -         23.1       Stage farmy and manue       -       -         23       Inorganic ferilizer (per tree)       -       -         10															
- Local     - Pdembang     - Interbeginning of rainy     season. Or any time if there is     available economically water     to be watering     and watering if no rain     (3.5 fiter/needday)				-											
- Pdcmbang       •         1.2 Is the beginning of rainy scason. Or any time if there is available economically water to be watering       •         1.3 The young tree needs shaling and watering if no rain (3 S) firedree(Jay)       •         2. Fortilization       •         2.1 Stice dree(Jay)       •         2.1 Stice dree(Jay)       •         2.1 Stice dree(Jay)       •         2.2 Organic manue (per tree) First application as basic fertilization in planing time; the next will be in rainy season       •         2.2.1 15 kg farmyard manue       •         2.3 togganic fertilizer (for tree) Twice a year at the beginning and the end of rainy season       •         2.3.1 Urca a St gg       •         2.3.2 TSP       2.5 g         2.3.3 KC1       10 g         2.3.4 KC1       10 g         2.3.5 kg farmyard manue       •         2.3.2 TSP       2.5 g         2.3.3 KC1       10 g         10 g       •         2.3.5 kg may ason       •         2.3.1 Krigation       •         1.4 frigation       •         1.5 for a season       •         2.3.1 krigation       •         1.5 for a season       •         2.3.1 krigation       • <td< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>															
12       Is the beginning of calay season. Or any time if there is available cononically water to be watering       *         13       The young itee needs shaling and watering if no rain (3-5 liter/tree/day)       *         2.       Pertilization       *         2.       1 Self conditioner       *         15.       The young itee needs shaling and watering if no rain (3-5 liter/tree/day)       *         2.       Pertilization       *       *         2.       Total conditioner       *       *         15.       The young itee needs shaling and watering if no rain (3-5 liter/tree/day)       *       *         2.       Organic manue (5pt rice)       *       *       *         12.0.       Solic formanue (per tree)       *       *       *         22.0.       Solic formanue (per tree)       *       *       *         22.1.       S kg farmyand manue 2       *       *       *         30 kg farmyand manue 3       *       *       *       *         3.       Sig farmyand manue 4       *       *       *       *         2.3.       Is garany ananue 3       *       *       *       *         2.3.       Is garan       *       *       *															
season. Or any time if there is available economically water to be watering				·· · · · · · · · ·				t		*					
available economically water       to be watering       1.3 The young tree needs shaling       and watering if no rain       (3.5 The young tree needs shaling       and watering if no rain       (3.5 The young tree needs shaling       and watering       1.3 Soft conditioner       1.5 The young tree needs shaling       and watering       1.5 Soft conditioner       1.5 The young tree needs shaling       and watering       2.1 Soft conditioner       1.5 The young tree needs shaling       and watering if no rain       2.1 Soft conditioner       1.5 The young tree needs shaling       restriction in planing time;       the next will be in rainy       season       2.1 Is kg farmyard manure       3.5 kg farmyard manure       3.6 kg garmy and manure       3.7 kg       4.7 St to so the beginning       and the end of rainy season       and the end of rainy season       2.3.1 Uro So g       2.3.2 TSP       2.5 g       3.6 farmy season       3.7 trigation       11 for a in															
to be watering															
1.3 The young tree needs shading and watering if no rain (X-5 IterChreeCday)															
and watering if no rain       (1.5 fiter/necdday)         2. Tertifization       •         2.1 Soli conditioner       •         If soil pH below 5.5 adjust       •         with lime at rate of 2.5-3.5       •         conffa; at least each 5 years       •         2.2 Organic manue (per tree)       •         Pirst application as basic       •         fertilization in planting time;       •         the east will be in rainy       •         season       •         2.1 15 kg farmyad manue       •         2.2 Negamyad manue       •         2.3 Inorganic fertilizer (per tree)       •         Twice a year at the beginning       •         and the end of rainy season       •         2.3.1 Urea       S0 g         75 g       •         2.3.2 TSP       25 g         2.3.8 KCl       10 g         10 g       •         2.3.3 KCl       10 g         10 g       •         2.3.1 Wrigation       •         11 for or in the tree needs watering         200 g       •         3.1 Brigation       •         11 for or in the tree needs watering         20.0 g									┨						
(3.5) http://conductore/day)         2. Tertilization         2.1 Soli pH below 5.5 adjust         with line at rate of 2.5-3.5         ton/ha; at least each 5 years         2.1 Soli pH below 5.5 adjust         with line at rate of 2.5-3.5         ton/ha; at least each 5 years         2.2 Organic manue (per tree)         First application as basic         fertilization in planting time;         the next will be in rainy         second         2.2.1 15k g farmyard manue         3 bkg farmyard manue         3 bkg farmyard manue         3 bkg farmyard manue         3 bkg farmyard manue         3.1 Urea       50 g         1.3.1 Urea       50 g         2.3.2 TSP       25 g         2.3.2 TSP       25 g         3.3 kg (2 g         3.4 (2 3.3 KCl       10 g         10 g       1         2.3.3 KCl       10 g         3.4 (2 3.3 kccl       *         3.5 kg farmyard         3.5 kg farmyard         3.5 kg farmyard         4.2.3 hordice (ach y eason         2.3.1 Urea       50 g         3.5 kg farmyard         3.6 g g       *         3.7 Sg															
2. Fertilization       •       •         2.1 Soil conditioner       •       •         If soil pH below 5.5 adjust       •       •         vinh lime at rate of 2.5-3.5.       •       •         ton/ha: at least each 5 years       •       •         2.2 Organic onance (per tree)       First application as basic       •         fertilization in planting time;       •       •         the next will be in rainy       •       •         season       •       •         2.1 15 kg farmyard manure       •       •         30 kg farmyard manure       •       •         33 kg farmyard manure       •       •         2.3 Inorganic fertilizer (per tree)       •       •         Twice a year at the beginning       •       •         and the end of rainy season       •       •         2.3.1 Urca       50 g       •       •         2.3.2 TSP       25 g       •       •         30 g       •       •       •         2.3.3 KCI       10													]		
2.1 Soil conditioner       *       *         If soil pit kelow 5.5 adjust       *       *         with lime at take 0.5 5.3 systems       *       *         2.2 Organic manue (per tree)       *       *         First application as basic       fertilization in planting time;       *       *         the next will be in rainy       *       *       *         season       *       *       *         22.1 15 kg farmyard manue       *       *       *         30 kg farmyard manue       *       *       *         33 kg farmyard manue       *       *       *         33 kg farmyard manue       *       *       *         Twice a year at the beginning       *       *       *         and the end of rainy season       *       *       *         2.3.1 Urea       50 g       1       *       *         2.3.2 TSP       25 g       1       *       *         2.3.3 KC1       10 g       1       *       *         10 g       2       *       *       *         2.3.3 KC1       10 g       *       *       *         10 g       2       *       *						<b> </b>	L				ļ	ļ		L	ļ
If soil pH below 5.5 adjust with lime at tate of 2.5-3.5 toorhay at least each 5 years						L	ļ				<b>.</b>	<b>_</b>		ļ	
with lime at rate of 2.5-3.5         ton/ha; at least each 5 years         2.2       Organic manure (per tree)         First application as basic         feedilization in planting time;         the next will be in rainy         season         2.2.1 15 kg farmyard manure         2.1       20 kg farmyard manure         2.2.3       10 kg farmyard manure         3.3       30 kg farmyard manure         4.3.3       10 kg farmyard manure         4.3.4       *         2.3.1       Urea         50 g       2         2.3.1       Urea         50 g       2         2.3.2       TSP         2.3.4       *         2.3.5       50 g         2.3.4       *         2.3.5       50 g         2.3.4       *         50 g       3         -75 g       4         2.3.4       *         2.3.5       3         3.0 gg       4         2.3.4       *         2.3.5       4         2.3.4       *         2.3.5       3         3.6       4         2.3.7 <td>2,1 \$</td> <td>Soil conditioner</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>]</td> <td>*</td> <td></td> <td></td> <td></td> <td></td> <td></td>	2,1 \$	Soil conditioner							]	*					
ton/ha: at least each 5 years.         2.2       Organic manure (per tree)         First application in planting time;         the next will be in rainy         season         [2.2.1] 15 kg farmyard manure         30 kg farmyard manure         33 kg farmyard manure         33 kg farmyard manure         34 kg farmyard manure         35 kg farmyard manure         36 kg farmyard manure         37 kg farmyard manure         38 kg farmyard manure         39 kg farmyard manure         21 Inorganic fertilizer (per tree)         Twice a year at the beginning         and the end of rainy season         2.3.1       Urea         50 g       2         2.3.2       TSP         25 g       1         2.3.3       KCI         10 g       1         2.3.3       KCI         10 g       2         10 g       1         2.3.4       10 g         2.3.5       200 g         3.1       Urig season         3.1       10 g         2.3.3       10 g         2.4       10 g         2.5       200 g <td< td=""><td></td><td>If soil pH below 5.5 adjust</td><td></td><td></td><td>ļ</td><td>ļ</td><td>í -</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>1</td></td<>		If soil pH below 5.5 adjust			ļ	ļ	í -								1
2.2 Organic manure (per tree)         First application as basic         fertilization in planting time;         the next will be in rainy         season         2.1 15 kg farmyard manure         2.1 15 kg farmyard manure         35 kg farmyard manure         35 kg farmyard manure         4         2.3 Inorganic fertilizer (per tree)         Twice a year at the beginning         and the cod of rainy season         and the cod of rainy season         2.3.1 Urca       50 g         30 g       4         2.3.2 TSP       25 g         2.3.2 TSP       25 g         2.3.3 KC1       10 g         10 g       *         2.3.3 KC1       10 g         10 g       *         2.3.2 TSP       25 g         2.3.3 KC1       10 g         10 g       *         2.00 g       4         3. Irrigation       *         If no rain the tree needs watering       *         20.2 Stitter/tree/day       *         20.3 Reiny season       *         3.1 Dy season       *         3.2 Rainy season       *         4. Pest cortof (each year) <t< td=""><td></td><td>with lime at rate of 2.5-3.5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>1</td><td></td><td></td><td></td><td></td><td></td></t<>		with lime at rate of 2.5-3.5								1					
2.2 Organic manure (per tree)         First application as basic         fertilization in planting time;         the next will be in rainy         season         2.1 15 kg farmyard manure         2.1 15 kg farmyard manure         35 kg farmyard manure         36 kg farmyard manure         37 kg farmyard manure         4         2.3 Inorganic fertilizer (per tree)         Twice a year at the beginning         and the end of rainy season         2.3.1 Urca         50 g         2.3.2 TSP         25 g         2.3.2 TSP         25 g         2.3.3 KC1         10 g         2.3.3 KC1         10 g         2.3.4 KC1         10 g         2.3.5 kg farmy season         2.3.7 KC1         10 g         2.4 the needs watering         200 g         4         3.1 Trigation         If no rain the tree needs watering		ton/ha; at least each 5 years											ł.		
First application as basic fertilization in planting time; the next will be in rainy season <ul> <li>2.1 Is kg farmyard manure</li> <li>20 kg farmyard manure</li> <li>20 kg farmyard manure</li> <li>30 kg farmyard manure</li> <li>31 kg farmyard manure</li> <li>32 kg farmyard manure</li> <li>33 kg farmyard manure</li> <li>34 kg farmyard manure</li> <li>35 kg farmyard manure</li> <li>36 kg farmyard manure</li> <li>37 kg farmyard manure</li> <li>38 kg farmyard manure</li> <li>39 kg farmyard manure</li> <li>30 kg farmyard manure</li> <li>30 kg farmyard manure</li> <li>31 kngance fettilizer (per tree)</li> <li>Twice a year at the beginning and the end of rainy season</li> <li>30 kg</li> <li>30 kg</li> <li>30 kg</li> <li>30 kg</li> <li>30 kg</li> <li>4</li> <li>4</li></ul>							1	<u> </u>	Γ	[	[				
fertilization in planting time; the next will be in rainy season       image: season         2.1       15 kg farmyard manure       image: season         2.1       15 kg farmyard manure       image: season         35 kg farmyard manure       image: season       image: season         2.3       Inorganic fertilizer (per tree)       image: season         Twice a year at the beginning and the end of rainy season       image: season         2.3.1       Urea       50 g         2.3.2       TSg       image: season         2.3.2       TSg       image: season         2.3.2       TSg       image: season         2.3.2       TSg       image: season         2.3.3       KC1       10 g         2.3.3       KC1       10 g         2.3.3       KC1       10 g         10 g       image: season       image: season         3.4       image: season       image: season         3.4       Irigation       image: season         10 g       image: season       image: season         3.4       image: season       image: season         3.5       Irigation       image: season         3.6       image: season       image: season							1	ļ		1					
the next will be in rainy season       i       i       i         2.2.1 15 kg farmyard manure       1       i       i         20 kg farmyard manure       3       i       i         35 kg farmyard manure       3       i       i         2.3 Inorganic ferilizer (per tree)       i       i       i         Twice a year at the beginning and the end of rainy season       i       i       i         2.3.1 Urea       50 g       1       i       i         2.3.2 TSP       25 g       1       i       i         2.3.2 TSP       25 g       1       i       i         2.3.3 KC1       10 g       1       i       i         2.3.3 KC1       10 g       1       i       i         10 g       200 g       i       i       i       i         3.1 Trigation       ifn or an the tree needs watering       i       i       i       i         3.2.2 Stier/tere/day       i       i       i       i       i       i         3.1 Trigation       ifn or an the tree needs watering       i       i       i       i       i         3.2.2 Stier/ter/ter/day       i       i       i       i				1	1	I	1	1	1		1	I	l I	1	I
sesson       *       *         21. 15 kg farmyard manure       2       *         30 kg farmyard manure       3         35 kg farmyard manure       *         35 kg farmyard manure       *         35 kg farmyard manure       *         36 kg farmyard manure       *         37 kg farmyard manure       *         38 kg farmyard manure       *         39 kg farmyard manure       *         30 kg farmyard manure       *         31 Ibrig at the beginning       *         and the cod of tainy season       *         2.3.1 Urca       50 g         30 g       *         23.2 TSP       25 g         23 g       *         30 g       *         4       *         2.3.3 KCl       10 g         10 g       3         20 g       *         3. Ibrigation       *         If no rain the tree needs watering         200 g       *         3.1 Dry season       *         3.2 Rainy season							1				1				
22.1 15 kg farmyard manure       1         20 kg farmyard manure       2         30 kg farmyard manure       3         35 kg farmyard manure       4         2.3 Inorganic fettilizer (per tree)       *         Twice a year at the beginning       *         and the end of rainy season       *         2.3.1 Urea       50 g         2.3.2 TSP       25 g         25 g       *         2.3.2 TSP       25 g         2.3.3 KCl       10 g         10 g       1         2.3.3 KCl       10 g         10 g       2         2.3.4 Urea       *         2.3.5 Kcl       *         10 g       1         2.3.3 KCl       10 g         10 g       2         2.3.3 KCl       10 g         10 g       4         2.3.3 KCl       10 g         10 g       *         2.3.4 KirtheetAay         3.1 Trigation       *         If no rain the tree needs watering         20-25 liter/triteetAay         3.1 Dry season         3.2 Roiny season         4. Pest control (each year)         Spray with insecticide and </td <td></td> <td></td> <td></td> <td></td> <td></td> <td>i i</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>						i i									
20 kg farmyard manure       2         30 kg farmyard manure       3         35 kg farmyard manure       4         2.3 Inorganic fertilizer (per tree)       *         Twice a year at the beginning       *         and the end of rainy season       *         2.3.1 Urea       50 g         2.3.1 Urea       50 g         2.3.2 TSP       25 g         2.3.2 TSP       25 g         2.3.3 KCl       10 g         10 g       1         2.3.3 KCl       10 g         10 g       2         10 g       2         10 g       1         2.3.2 TSP       25 g         2.3.3 KCl       10 g         10 g       2         10 g       1         2.3.3 KCl       10 g         10 g       2         10 g       4         2.3.3 know       4         3. Irrigation       11 for rain the tree needs watering         20 c       4         3.1 Dry season       4         3.2 Rainy season       4         4. Pest control (each yeat)       *         Spray with insecticide and fruit       frungicide to prevent/re control fruit			1						<u>†                                    </u>	*				<u> </u>	
30 kg farmyard manure       3         2.3 Inorganic fertilizer (per tree)       *         Twice a year at the beginning       *         and the end of rainy season       *         2.3.1 Urea       50 g         2.3.1 Urea       50 g         50 g       *         75 g       *         75 g       *         2.3.2 TSP       25 g         2.3.3 KCl       10 g         10 g       *         2.3.4 Kcl       *         10 g       *         2.00 g       4         *       *         10 g       *         10 g       *         10 g       *         2.00 g       4         *       *         10 g       *         10 g       *         10 g       *         10 g       *         10				•	1			1				*			
35 kg farmyard manure       4       *         2.3 Inorganic fertilizer (per tree) Twice a year at the beginning and the end of rainy season       *       *         2.3.1 Urea       50 g       1       *       *         2.3.1 Urea       50 g       1       *       *         2.3.2 TSP       25 g       1       *       *         2.3.2 TSP       25 g       2       *       *         2.3.2 TSP       25 g       2       *       *         2.3.3 KCl       10 g       1       *       *         2.3.3 KCl       10 g       2       *       *         10 g       3       *       *       *         2.00 g       4       *       *       *         3. trigation       *       *       *       *         3. trigation       *       *       *       *         3.1 Dry season       *       *       *       *         3.2 Rainy season       *       *       *       *         3.2 Roiny season       *       *       *       *         3.1 trigation function there needs watering       *       *       *         3.2 Roiny season						1						•			
2.3 Inorganic fertilizer (per tree) Twice a year at the beginning and the end of rainy season       •       •         2.3.1 Urea       50 g       1       •         2.3.1 Urea       50 g       2       •         50 g       3       •       •         2.3.1 Urea       50 g       2       •         50 g       3       •       •         2.3.1 Urea       50 g       2       •         2.3.2 TSP       25 g       1       •         2.3.2 TSP       25 g       3       •         2.3.3 KCl       10 g       1       •         10 g       3       •       •         2.3.3 KCl       10 g       1       •         10 g       3       •       •         2.00 g       4       •       •         3. Irrigation       If no rain the tree needs watering       200 g       •         2.0.2 Silter/tree/day       .       •       •         3.1 Dry season       •       •       •       •         3.2 Rainy season       •       •       •       •         3.2 Rainy season       •       •       •       •         4. Pest control													1		i i
Twice a year at the beginning and the end of rainy season <ul> <li>3.1 Urea</li> <li>50 g</li> <li>4</li> <li></li></ul>			4		ł		<b>.</b>	+		-				<u> </u>	<u> </u>
and the cad of rainy season       *       *       *         2.3.1 Urea       50 g       1       *       *         S0 g       3       *       *       *         2.3.1 Urea       50 g       3       *       *       *         S0 g       3       *       *       *       *         2.3.2 TSP       25 g       1       *       *       *         2.3.2 TSP       25 g       2       *       *       *         2.3.2 TSP       25 g       3       *       *       *         2.3.2 TSP       25 g       3       *       *       *         2.3.3 KCl       10 g       1       *       *       *         10 g       2       *       *       *       *         2.00 g       4       *       *       *       *         3. Irrigation       ff no rain the tree needs watering       200 g       *       *       *         2.02 g       4       *       *       *       *       *       *         3. Irrigation       ff no rain the tree needs watering       200 g       *       *       *       *						1									
2.3.1 Urea       50 g       1       *       *       *       *         50 g       3       *       *       *       *       *       *         2.3.2 TSP       25 g       1       *       *       *       *       *         2.3.2 TSP       25 g       1       *       *       *       *       *       *         2.3.2 TSP       25 g       2       *       *       *       *       *       *       *       *         2.3.2 TSP       25 g       3       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *					ļ										
S0 g       2       *       *       *       *         50 g       3       *       *       *       *       *         2.3.2 TSP       25 g       1       *       *       *       *       *         2.3.2 TSP       25 g       2       *       *       *       *       *       *         2.3.2 TSP       25 g       3       *       *       *       *       *       *         2.3.3 KCl       10 g       1       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *												┼───		+	<u> </u>
So g       3       *       *       *         2.3.2 TSP       25 g       1       *       *       *         25 g       25 g       1       *       *       *         25 g       3       *       *       *       *         23.2 TSP       25 g       1       *       *       *         25 g       3       *       *       *       *         23.3 KCl       10 g       1       *       *       *         10 g       2       *       *       *       *         20.3 KCl       10 g       1       *       *       *         10 g       3       *       *       *       *         200 g       4       *       *       *       *         3.1 trigation       If no rain the tree needs watering       200 g       *       *       *         3.2 Rainy season       *       *       *       *       *       *         4. Post control (each yeat)       Spray with insecticide and       *       *       *       *       *         Spray with insecticide and       *       *       *       *       *			1						1	Į –					
75 g       4       *       *       *         2.3.2 TSP       25 g       1       *       *       *         25 g       25 g       3       *       *       *         30 g       4       *       *       *       *         2.3.3 KCl       10 g       1       *       *       *         10 g       2       *       *       *       *         10 g       3       *       *       *       *         3. Irrigation       If no rain the tree needs watering       200 g       *       *       *         20.2 S liter/tree/day       200 g       *       *       *       *       *         3.1 Dry season       *       *       *       *       *       *       *         3.2 Rainy season       *       *       *       *       *       *       *         4. Post control (each year)       *       *       *       *       *       *         Spray with insecticide and fungicide to prevent/to control fruit flies and borer, dye back, gloesporium etc.       *       *       *       *       *         5. Other operations       *       *       *       <			2			1								!	
2.3.2 TSP       25 g       1       *       *       *       *         25 g       30 g       4       *       *       *       *       *         2.3.3 KCl       10 g       1       *       *       *       *       *       *         2.3.3 KCl       10 g       1       *       *       *       *       *       *         2.3.3 KCl       10 g       1       *       *       *       *       *       *         10 g       2       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       <															*
25 g       2       *       *       *         25 g       3       *       *       *         23.3 KC1       10 g       1       *       *       *         10 g       2       *       *       *       *         200 g       4       *       *       *       *         3. Irrigation       If no rain the tree needs watering       200 g       *       *       *         3. Irrigation       If no rain the tree needs watering       200 g       *       *       *       *         3.1 Dry season       *       *       *       *       *       *       *         3.2 Rainy season       *       *       *       *       *       *       *         4. Pest control (each year)       *       *       *       *       *       *       *         spray with insecticide and       fungicide to prevent/to control fruit       fungicide to prevent/to control fruit       fungicide to prevent/to control fruit       *       *       *       *         5. Other operations       *       *       *       *       *       *       *       *         5.1 Soil under the crown has to be       *				·	<b>_</b>		4	<u> </u>	*	_	-	<b> </b>	<b>i</b>	<b>_</b>	+*
25 g       3       *       *       *       *         2.3.3 KCl       10 g       1       *       *       *       *         10 g       2       *       *       *       *       *         10 g       3       200 g       4       *       *       *       *         3. trigation       10 g       3       *       *       *       *       *         3. trigation       16 or ain the tree needs watering       200 g       4       *       *       *         3.1 Dry season       *       *       *       *       *       *       *         3.2 Rainy season       *       *       *       *       *       *       *         Spray with insecticide and fungicide to prevent/to control fruit thies and borer, dye back, gloesporium etc.       *       *       *       *         5. Other operations       *       *       *       *       *       *       *         5.1 Soil under the crown bas to be chopped       *       *       *       *       *       *		e	1	i I					*						*
30 g       4       *       *       *         2.3.3 KCl       10 g       1       *       *       *         10 g       2       *       *       *       *         10 g       3       *       *       *       *         3. Irrigation       If no rain the tree needs watering       *       *       *       *         20.25 liter/tree/day       *       *       *       *       *       *         3.1 Dry season       *       *       *       *       *       *         3.1 Dry season       *       *       *       *       *       *         3.2 Rainy season       *       *       *       *       *       *         4. Pest control (each year)       *       *       *       *       *       *         Spray with insecticide and fungicide to prevent/to control fruit tlies and borer, dye back, gloesporium etc.       *       *       *       *       *       *         5. Other operations       *       *       *       *       *       *       *       *         5.1 Soil under the crown bas to be chopped       *       *       *       *       *       *			2	2]					*	1					*
2.3.3 KCl       10 g       1       *       *       *       *         10 g       3       200 g       4       *       *       *       *         3. Irrigation       If no rain the tree needs watering       200 g       4       *       *       *       *         3. Irrigation       If no rain the tree needs watering       20.25 liter/tree/day       *       *       *       *         3.1 Dry season       *       *       *       *       *       *       *         4. Pest control (each year)       *       *       *       *       *       *       *         Spray with insecticide and fungicide to prevent/to control fruit thies and borer, dye back, gloesporium etc.       *       *       *       *       *         5.1 Soil under the crown bas to be chopped       *       *       *       *       *       *		25 g	3	3					*						*
10 g       2       *       *       *         10 g       3       200 g       4       *       *         3. Irrigation       If no rain the tree needs watering       20-25 liter/tree/day       *       *       *         3.1 Dry season       3.2 Rainy season       *       *       *       *       *         4. Pest control (each year)       *       *       *       *       *       *         Spray with insecticide and fungicide to prevent/to control fruit       *       *       *       *       *         5. Other operations       *       *       *       *       *       *         5.1 Soil under the crown has to be chopped       *       *       *       *       *		30 g		<u>ډ</u>				1	*						*
10 g       3       *       *       *       *         3. Irrigation       If no rain the tree needs watering       200 g       4       *       *       *       *         3.1 Dry season       3.1 Dry season       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •		2.3.3 KCI 10 g	1	I.					*						*
10 g       3       *       *       *       *         3. Irrigation       If no rain the tree needs watering       200 g       4       *       *       *       *         3.1 Dry season       3.1 Dry season       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •			2	2					*	I	1		Į	1	*
200 g     4     *     *       3. Irrigation     If no rain the tree needs watering     20-25 liter/tree/day     *       20-25 liter/tree/day     *     *     *       3.1 Dry season     *     *     *       3.2 Rainy season     *     *     *       4. Pest control (each year)     *     *     *       Spray with insecticide and     *     *     *       fungicide to prevent/to control fruit     *     *     *       thies and borer, dye back, gloesporium     *     *     *       etc.     *     *     *       5. Other operations     *     *     *       5.1 Soil under the crown has to be     *     *     *       chopped     *     *     *		10 g		3		1		1	*			1	1		*
3. Irrigation       If no rain the tree needs watering         20-25 liter/tree/day				1					*						*
20-25 liter/tree/day	3. Irriga	ation				T								[	
20-25 liter/tree/day	FI 6 -													1	
3.1 Dry season       Image: Control (ach year)         3.2 Rainy season       Image: Control (ach year)         4. Pest control (each year)       Image: Control (ach year)         Spray with insecticide and       Image: Control fruit         fungicide to prevent/to control fruit       Image: Control fruit         files and borer, dye back, gloesporium       Image: Control fruit         state       Image: Control fruit         5. Other operations       Image: Control fruit         5.1 Soil under the crown has to be       Image: Control fruit         5.2 Dry and dead twig has to be       Image: Control fruit															1
3.2 Rainy season <ul> <li>A. Pest control (each year)</li> <li>Spray with insecticide and fungicide to prevent/to control fruit thies and borer, dye back, gloesporium etc.</li> <li>S. Other operations</li> <li>S. Other operations</li> <li>Soil under the crown has to be the chopped</li> <li>S.2 Dry and dead twig has to be</li> <li>*</li> <li>*</li> <li>*</li> <li>*</li> <li>*</li> <li>*</li> <li>*</li> <li>*</li> </ul> <ul> <li>*</li> </ul> <ul> <li>*</li> </ul> <ul> <li>*</li> <li>*</li> <li>*</li> <li>*</li> <li>*</li> </ul> <ul> <li>*</li> </ul> <ul> <li>*</li> <li>*</li> <li>*</li> <li>*</li> <li>*</li> <li>*</li> <li>*</li></ul>					1-	1	1	1-		N	1	1	1	1	1
4. Pest control (each year)       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *				1	- <b> </b>	+	1	1		-	1-	1	1	1	1
Spray with insecticide and fungicide to prevent/to control fruit flies and borer, dye back, gloesporium etc.       Image: Spray with insecticide and fundicide to prevent/to control fruit flies and borer, dye back, gloesporium etc.         5. Other operations       Image: Spray with insecticide and flies and borer, dye back, gloesporium etc.         5. Other operations       Image: Spray with insecticide and fliesport         5.1 Soil under the crown has to be chopped       *         5.2 Dry and dead twig has to be       *				1	+	*	1	+		*	1	1	1	+ +	<u>+</u>
fungicide to prevent/to control fruit       flies and borer, dye back, gloesporium       etc.       5. Other operations       5.1 Soil under the crown has to be       chopped       5.2 Dry and dead twig has to be				1	1						1				
flies and borer, dye back, gloesporium etc.															Ì
etc.     5. Other operations     6.1 Soil under the crown has to be chopped     7.1 Soil under the crown has to be chopped     7.2 Dry and dead twig has to be     7.4 *			m		Í	1	1		1				1		
5. Other operations     *     *       5.1 Soil under the crown has to be     *     *       chopped     *     *       5.2 Dry and dead twig has to be     *     *		and ource, aye back, groesponut	111						I	1	1		1	1	
5.1 Soil under the crown has to be     *     *     *       chopped     *     *     *       5.2 Dry and dead twig has to be     *     *     *						+	+	+	+				- <b></b>		+
chopped       5.2 Dry and dead twig has to be				+	<u> </u>		+	- <u> </u>		+	- <b>h</b>	<u> </u>	_		–
5.2 Dry and dead twig has to be * * *	5.1			*				*			ļ	*			
				1		-	ļ	- <b> </b>		+		- <b> </b>	4		
prunned and burnt	5.2			*				*				*			
		prunned and burnt		Ì			1								

## Table B-4-7 Duku Management Calendar (1/2)

Operation	Year	Apr.	Мау	100.	Jul.	Aug.	sep.	OCI.	Nov.	i.ec.	J&N.	Feb.	,•1di
Bearing Tree												<b> </b>	
I. Fertilization	· ·				· ·								
1.1 Soil conditioner											ļ		
After 5 years apply second	5						1				i	1	
liming at the rated 2.5-3.5	б							*					1
ton/ha in the rainy season	7											]	
	8												
	9		ļ								1	1	
	10			<u> </u>									<b>.</b>
1.2 Organic manure (per tree)	-								1				
Apply once a year in rainy		1	1					ļ					
season							ļ				<b> </b>		
1.2.1 40 kg farmyard manure	5		[					*		1			
40 kg farmyard manure	6							*			1	1	
40 kg farmyard manure	7							*					
40 kg farmyard manure	Ę		1	1	1	1	1	*	1		1	1	
40 kg farmyard manure	9			1		1		*		1	1	1	
40 kg farmyard manure	10							*		L			<b>_</b>
1.3 Inorganic fertilizer (per tree)		T	1					[					
Twice a year, in the beginning					1				1				
and the end of rainy season													1
1.3.1 Urea 75 g		5		1	Τ		*	1					1
75 g		s				1	*						
80 g	,						*						
80 g	;	8					*			1		1	1
90 g		9					*						
90 g	1						*						
1.3.2 TSP 30 g		5			1		*	T	1	T			
30 g		6					*	1		1			
40 g		7		1	Í		*						
40 g		8					*	1			1		
50 g		9		1			*						
50 g		0					*				1		
1.3.3 KCl 20g		5			1		*						
20 g		6					*						
30 g		7					*					1	
30 g		8					*						
40 g		9					+		ł				
40 g	1	0					*						
2. Irrigation		-				_				Ţ		1	
Similar to the nonbearing plant		1										<u> </u>	
2.1 Dry season		-		-									
2.2 Rainy season			-		-1-			-					$\pm$
3. Pest control		1						*			T	*	ſ
Similar to the non bearing plant		1	1						ļ				
4. Other operation				-1	-t-	*		-1		*	-		T
Similar to the non bearing plant					i		Į			1			
					-+-					-1-			1
5. Harvesting 5.1 Flowering season, fruit setting		-1-					-			-		-	Ť
	•						Ī			Í			
and maturity		<u> </u>				-   -	+				-	-	-
5.2 Harvesting season		·   `	1				1					1 ľ	1

## Table B-4-7 Duku Management Calendar (2/2)

# Table B-4-8 Durian Management Calendar (1/2)

		Apr.	May	i Jun.	Jul.	Aug.	sep.		Nov.	186.	Jan.	FCD.	Ma
Non Bearing Tree			ļ				<b> </b>			<b> </b>	<b> </b>	┣	
1. Planting			<b> </b>								┣		
1.1 Variety:								1				i	
- Sitembaga, Sijantung, Otong,	i									ł	ļ		
Kani, Matahari and Hepi							ļ			<b>I</b>	L		<b> </b>
1.2 In the beginning of rainy								*					ļ
season. Or any time if there is				1						1			1
available economically water			ļ									1	I I
to be watering								1		ļ	Ĺ	<u> </u>	I
1.3 The young tree needs shading			Γ						]				
and watering if no rain						ļ			i i			1	
(3-5 liter/tree/day)						1						I	
2. Fertilization					1								I
2.1 Soil conditioner			1			1		*	<u> </u>				1
If soil pH below 5.5 adjust													
with lime at rate of 2.5-3.5				1		1							
ton/ha; at least each 5 years													
			+		1	+-		1		t		1	1
2.2 Organic manure (per tree)	_	I I	ļ	1						1	1		
First application as basic fertiliza	-		1	1		1	1	l	1			1	
tion in planting time; the next		1		1	1		1			1	1	1	
will be in rainy season		<b>}</b> →—		+		+		*	1				+
2.2.1 40 kg farmyard manure	1									*			
50 kg farmyard manure	2			1		1				•	i i		
80 kg farmyard manure	د ،									+			
90 kg farmyard manure	4	<b>I</b> —		+					+		+		+
2.3 Inorganic fertilizer (per tree)													
Twice a year at the beginning													
and the end of rainy season				+	+	+	+		╅				
2.3.1 Urea 8 g	1												
30 g	2	2	1							Ì			
60 g		3					*						
<u>60 g</u>	4	ŧ		<u> </u>	+		+		1		-		
2.3.2 TSP 16 g	1	1					*						
60 g	2	2			ł		*		1				
120 g	-	3					*	ļ					1
120 g		4					*			_			<u> </u>
2.3.3 KCl 16 g		1					*			1			1
60 g		2					*						
120 g		3	1				*						
120 g		4			_		*				_		
3. Irrigation						í							
If no rain the tree needs watering													
20-25 liter/tree/day													
3.1 Dry season		-						-					
3.2 Rainy season			_					-		+			
4. Pest control (every 4 months)					*			*	-			*	-
Spray with insecticide and fungicide						l		Ì					
to prevent/control				1							Í		
- caterpillars, aphids, soft scale,													
Nower, fruit and stem borer					1				1				
- leaf blight, die back, twig blight,						ļ	1						
antracnosa, powdery mildew and				1		1							
pink disease			_		_ <del> </del> -		-+-			-+-			+
5. Other operations				_	*				-				*
5.1 Soil under the crown has to be					* <b> </b>		l			l			·
chopped					<del>.</del>  -								+
5.2 Dry and dead twig has to be		ļ		I	*								
prunned and burnt		1		1	1	1	1		1	1		1	

	Operation		Year	Apr.	May	Jun.	Jul.	Aug.	Sep.	Uxt.	Nov.	1200.	179	Feb,	Ma
Bearin	ng Tree														
	ilization				L		]	<b>_</b>						ļ	
	Soil conditions							]						1	
	After 5 years ap	ply second	5				!		l					Į	
	liming at the rat		6						I	*		Į			
	ton/ha in the rai		7												1
	•••	·	8				ł							1	
			9							1				1	
			10											<u> </u>	
12	Organic manure	(per tree)			1					Γ					
1	Apply once a ye														1
	season					1	1		1						
		armyard manure	5			1	1	1		*	[				
		armyard manure	6							*	i i				
		armyard manure	6 7				1	1		*					
		armyard manure	8	1						*					
		armyard manure	9							*					
		armyard manure	10							+					
13	Inorganic fertil														
	Twice a year, in				1	1	1	1	1			1	1	1	
	and the end of					1		1						]	
	1.3.1 Urea	60 g	5	1		1			*				T		
	I on one	60 g	ŧ						*						
		60 g	7										Į		
		60 g	8						+				1		
		60 g	9			1			*		1				
	1.	60 g	10						*	1					
	1.3.2 TSP	120 g			1			-	*	1					Τ
	1.0.2 101	120 g							*		1				
		120 g	-				i i		. *		1				
		120 g	5						*					1	
	1	120 g					1		+			1	1		
		120 g	10			1			*	1				1	
	1.3.3 KCI	120 g		5					*			1			1
	LJG KCI	120 g		6		1			*						
		120 g		7					*						
		120 g		8					*	1					
		120 g		9					*						
		120 g		0					*		Ì				
2 177	igation				1-					1					
	milar to the nonb	earing plant				ļ									
	Dry season						1	-		H					Τ
	2 Rainy season							-							
	est control					*		-		*				*	Т
	milar to the non l	searing plant					ļ								
	ther operation	Sector Provide		-	-†	*		-1	1	*		1	1	*	
- ei	milar to the non l	hearing plant			1								1		
	arvesting	Prairie Prairie		1	1				1		T		1	1	
1.1	I Flowering sea	son fauit setting			+	-1			-1	4			•		
<sup>3</sup>	and maturity	son, nuit setting				ł									
	2 Harvesting se	 ason			-1-			-							-
1 12	· inacreating of				1			1	í	1	1	1	1		1

## Table B-4-8 Durian Management Calendar (2/2)

Operation Y	e a í	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Ма
Non Bearing Tree	+												
1. Planting									1				
1.1 Variety:													
Arumanis, Gedonggincu, Manalagi												:	
1.2 In the beginning of rainy season.	· · · · · ·	· ·	·				†	*					
Or any time if there is available				1		1						Į	
economically water to be watering													
1.3 The young tree needs shading			†						<u> </u>	<b> </b>		1	1
and watering if no rain													
(3-5 liter/tree/day)									1				
2. Pruning for tree formation						t							
2.1 Prune the young of one year old				Į	<u>}</u>			*			-	t	
plant 50-60 cm from soil to have	'			1			l	ł					
only one single trunk with three-				1								1	
well placed primary branches													
2.2 Prune each three branches 30 cm	2		+	┨───	+		1	+ *					
from the trunk at two years old to	2												
have three-well placed secondary			1		1	1	1		1		ļ	1	1
branches	i		1		1	1	1	1	1	1	1	1	
2.3 The similar pruning will at	3		<u>†</u>	<del> </del>	+	1	+	*	1	†	1	·†	1
three years old plant	J		1	1	[	1			1	1		ł	1
3. Fertilization		ł	+	+	╂──	+	1	+	1		<u>+</u>	<b>†</b>	1
3. Fertilization 3.1 Soil conditioner			╂		+	+		<b>┼</b> ┈╴	+		<b></b>		
		1						ľ				1	
If soil pH below 5.5 adjust													
with lime at rate of 2.5-3.5													
ton/ha; at least each 5 years		├	- <b> </b>	·+									
3.2 Organic manure (per tree)												1	
First application as basic fertiliza- tion in planting time; the next			1				i i	i i					
will be in rainy season			Í		1								
3.2.1 20 kg farmyard manure	1		-				+	++		+-	+		+
30 kg farmyard manure	2									+			
40 kg farmyard manure	4									*	1		
50 kg farmyard manure	4									×			
3.3 Inorganie fertifizer (per tree)		1		1-	1	1				1	1		1
Twice a year at the beginning		1											
and the end of rainy season				1			1			í			
3.3.1 Urea 100 g					1-		*	1	-				•
125 g	2	2					*						1 *
150 g	3	5					*						*
200 g	_ 4						*						1
3.3.2 TSP 25 g	1			T	T	1	*			1			
50 g	2			ĺ		1	*				1		1
75 g	3						*					1	1
75 g	4	4				_	*			_	_ <b>_</b>		*
3.3.3 KCl 100 g	1		1				1 *		1				1
125 g		2			1		*					ļ	1
150 g		3			1		*				1		,
150 g		4			_		+*						+
4. Irrigation					1	1 I	1					1	1
If no rain the tree needs watering		1					1				ł	1	1
20-25 liter/tree/day								_					
4.1 Dry season		-										_	
4.2 Rainy season					T	T	T	-			-	-	
5. Pest control (each year)		1	1-	*	1	1		*				*	
Spray with insecticide and		1			ł		1						
fungicide to prevent/to control												Į	
- stem and shoot borers, psyllids, week	ál.		ł	1				1	1			1	
caterpillar, fermits and scale insects	.,	1				1	1						
- antracnosa, powdery mildew, red		I			1			1		1			
rust, root rot, bark and pink disease									1		1	1	
borer, antracnosa, cancer, rootrot		1		1	1	1						i i	1

### Table B-4-9 Mango Management Calendar (1/2)

.

Table B-4-9	- Mango Management Calendar (	(2/2)
-------------	-------------------------------	-------

rigada se	Operation	Year	Apr.	May	Jon.	Jul.	Aug.	Sep.	Ort	Nov.	Dec.	Jan.	Feb.	Ma
6.	Other operations (every 4 months)										. <u> </u>	<u> </u>	*	
	6.1 Soil under the crown has to be				*				*				1	
	chopped							ļ				Į		
1	6.2 Dry and dead twig has to be				*				*				*	
	prunned and burnt			ļ	<b>.</b>		ļ		<b></b>					
5. B	Bearing Tree							<b> </b>				ļ		
	Fertilization						I	<u> </u>	ļ	1		<b></b> .		I
	1.1 Soil conditioner											1	i i	
	After 5 years apply second	5										i		1
	liming at the rated 2.5-3.5	6			1	1			*					
	ton/ha in the rainy season	7			i i	i		1						
		8									ļ			
		9			1	1			1		1			1
		10					İ							
	1.2 Organic manure (per tree)							†—–	<b> </b>		1			T
	Apply once a year in rainy						1		1		1	1		1
	season 1.2.1 70 kg farmyard manure	5				1	1	1	*		1			
	100 kg farmyard manure	6							*				1	
	100 kg farmyard manure	7							*					
	100 kg farmyard manure	8			1			1	*					
		9			1				*		Į	1		
	100 kg farmyard manure	9							+		1			
	100 kg farmyard manure	- 10		+							╉──			+
	1.3 Inorganie fertilizer (per tree)													1
	Twice a year, in the beginning			ļ				1	ļ	1				
	and the end of rainy season		ł—	+			+	*		1				+,
	1.3.1 Urea 300 g	5				1					1			,
	435 g	6												
	435 g	7									1			
	435 g	8												
	435 g	9				1								
	435 g	10		_				<u> </u>						
	1.3.2 TSP 150 g	5												
	215 g	e						1.	1	i i				
	215 g	7						1			ļ		ļ	
	215 g	ş	3			1		1 *						
	215 g				ļ			*	i	1	•		1	
	215 g	<b>I</b>	<u>1</u>	_	_			+		<u> </u>				
	1.3.3 KCl 400 g	:	5					*						
	580 g	(	6		1			*						
	580 g	,	7					1 *				í		
1	580 g	:	8					*						
	580 g		9					*						
	580 g	1	0					*					<u> </u>	
	2. Irrigation						1							
	Similar to the nonbearing plant											_		
ļĮ	2.1 Dry season		-					· · · ·			_			
	2.2 Rainy season								<b>4</b> -					_
	3. Pest control		*				*				*			
1	Similar to the non bearing plant		ļ											
	4. Other operation		1		-				1				*	
	Similar to the non bearing plant							I				Í	j	
	5. Harvesting		1	-	- -							-1-	1	
	5.1 Flowering season, fruit setting		+	-†	+	-		-	-1-		-		- [ -	
			1					ľ						
	and maturity 5.2 Harvesting season		+		-+-	+	-+		╡					-
	1 15.2 Marvesung season		1	1	1		1	E E	17	1	1	- I	1	

Operation	Year	Apr.	May	Jun.	Jui.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	M
Non Bearing Tree			[				[		1	1		†	t
1. Planting													<b> </b>
L1 Variety:													
- Local													
- Kaligesing													
1.2 In the beginning of rainy								*				<u>}</u>	
season. Or any time if there is													
available economically water													
to be watering													
1.3 The young tree needs shading							• ••			····			
and watering if no rain												1	
(3-5 liter/tree/day)													
2. Fertilization													
2.1 Soil conditioner	·····					·		*					
If soil pH below 5.5 adjust													
with time at rate of 2.5-3.5													
ton/ha; at least each 5 years													
2.2 Organic manure (per tree)		·			·								
First application as basic												l	
fertilization in planting time;													
the next will be in rainy													
season													
2.2.1 40 kg farmyard manure	1							*			·		
40 kg farmyard manure	2									*			
40 kg farmyard manure	3									*			
40 kg farmyard manure	4									*			
2.3 Inorganic fertilizer (per tree)										•• ••			
Twice a year at the beginning						1	į,						
and the end of rainy season													
2.3.1 Urea 120 g	1						*			·			*
120 g	2						*						*
120 g	3						*						*
120 g	4	1					*						*
2.3.2 TSP 60 g	1						*						*
60 g	2						*						*
150 g	3		1				*						*
150 g	4						*						*
2.3.3 KCl 100 g	1			1			*						*
150 g	2		ļ	1		ļ	*						*
150 g	3			ļ			*						*
175 g	4						*						*
3. Irrigation			1										
If no rain the tree needs watering													
20-25 liter/tree/day													
3.1 Dry season		•					•						
3.2 Rainy season			Ì					•					
4. Pest control (each year)		1		*				*				*	
Spray with insecticide to						Í				Ì			
prevent/control mites										i			
5. Other operations							1						
5.1 Soil under the crown has to be				*	1			*				*	
chopped													
5.2 Dry and dead twig has to be				*	~			*				*	
prunned and burnt		1											

Table B-4-10 Mangosteen Management Calendar (1/2)

	Operation	Year	Apr.	May	Jun.	101.	Aug.	Sep.	OCL.	Nov.	Dec.	Jan.	Feb.	Ma
Bearin		الم			L									
	lization													
1.1	Soil conditioner				ł									
	After 5 years apply second	5												
	timing at the rated 2.5-3.5	6							*					Í
	ton/ha in the rainy season	7												
	·	8						:						
		9												
		10												
1.2	Organic manure (per tree)	•••												
	Apply once a year in rainy													
	season													
	1.2.1 40 kg farmyard manure	5							*					
	40 kg farmyard manure							l	*					
	40 kg farmyard manure						1		*					
	40 kg farmyard manure								*			ł		
	40 kg farmyard manure								*					
	40 kg farmyard manure								*					
112	Inorganic fertilizer (per tree)		·	ł——	<u> </u>									
	Twice a year, in the beginning						ļ							
	and the end of rainy season													
	1.3.1 Urea 350 g	5						<u>}</u>						*
	350 g	6						•		1		1		*
i	350 g	7				i								*
	350 g	8						*						*
		o 9						*	İ					*
	350 g 350 g	10					1	*						
		5		<b> </b>				*	<u> </u>					*
					1				i					*
	250 g	6			Ì					1				*
	250 g	7		i					ļ					
	250 g	8					1			ļ				
	250 g	9						Ţ.						
	250 g 1.3.3 KCl 250 g	10	<u> </u>							<b> </b>		ļ		;
		5		1								1	1	
	250 g	6		1			1	1.		i i				
	250 g	1												
	250 g	8						Ţ						
	250 g	9												
	250 g	10	<u>+</u>			┨┈──		<b> </b> •					<u> </u>	
2. Irri							1			1				
	ular to the nonbearing plant						<b>.</b>	<b> </b> _,			╂──	┨───		┢
	Dry season		<b>F</b>	<u> </u>		1		<b> "</b>				<b> </b>		+
	Rainy season					_	<b>_</b>		<b>4</b>			1		-
	t control		1	1	*				*			1	*	
	ular to the non bearing plant		╂	<b>_</b>		<b>_</b>	<b>-</b>	<b> </b>	<u> </u>	<b> </b>		<b> </b>	<del> </del>	+
	er operation		1	1	*	1			*		1	1	*	1
	nilar to the non bearing plant	<u> </u>	<b>_</b>	. <b> </b>	<b>.</b>	·			<b>_</b>	<b>_</b>	<b>_</b>	<u> </u>	<b>.</b>	+
	rvesting							.l		<u> </u>	_	1		<b>_</b>
[5.1	Flowering season, fruit setting	3				1			-	1	+-1	4	1	
	and maturity						<b>_</b>				1	<u> </u>		1_
5.2	Harvesting season											┣—		+
11			1	}	1	1		1	1	1	1	1	1	

 Table B-4-10
 Mangøsteen Management Calendar (2/2)

Table B-4-11	Marquisa	Management	Calendar
--------------	----------	------------	----------

Operation Ye		- <u>6</u> -	мау	Jun.	JUI.	Aug.	sep.	••••	1101.	Dec,	Jan.	Feb.	Ma
Planting	·											· · · ·	
1.1 Variety:								·					
- Asam Brastagi													
- Malino													
1.2 In the beginning of rainy							*						
season. Or any time if there is		1	į										
available economically water													
to be watering								1					
1.3 The young tree needs shading													
and watering if no rain													
(3-5 liter/tree/day)													
Fertilization							[			[			
2.1 Soil conditioner											[		
If soil pH below 5.5 adjust with				1									
lime at rate of 2.5-3.5 ton/ha; at							1						
least each 5 years				l		I						<u> </u>	<u> </u>
2.2 Organic manure (per tree)										1			
First application as basic				1									
fertilization in planting time; the												1	
next will be in rainy season				I	1					I			ļ
2.2.1 15 kg farmyard manure	4						*						ļ
20 kg farmyard manure	2							*		1		1	1
20 kg farmyard manure	3							*					
20 kg farmyard manure	4							*			<u> </u>	ļ	<b>_</b>
2.3 Inorganic fertilizer (per tree)													1
Twice a year at the beginning								ļ					1
and the end of rainy season	· _ <del>  _</del> -				<u> </u>			<u> </u>	<b> </b>	<u> </u>		<u> </u>	
2 3.1 Urea 187.5 g 187.5 g	4												
187.5 g	3				ł								
187.5 g	4								i –				
187.5 g	5												
2.3.2 TSP 281 g	1	•					*	<u>↓</u>		+		<u> </u>	,
281 g							*						, ,
281 g	3						*		1			1	
281 g	4						+		1		1		
281 g	s				1		*						
2.3.3 KCI 87.5 g	1			1	<u> </u>		*	1		1	1		
87.5 g	2						*						
87.5 g	3		1				*						
87.5 g	4				i i		*						
87.5 g	5			L			*						
. Irrigation				1									
If no rain the tree needs watering								1				1	
20-25 liter/tree/day			<b>İ</b>	L	L.		ļ	<b>_</b>	<b>_</b>				1
3.1 Dry season	×		<b>.</b>				+				<u> </u>	1	
3.2 Rainy season			<b> </b>		<u> </u>			<b></b>	<u> </u>				-
Pest control			<b>I</b>			1	ļ		<u> </u>				1
4.1 Spray with insectivide and				*			1	*	i i		1	*	
fungicide to control/to prevent from													
- scale, mite, fruit fly etc.			1										
- anthracnosa, scab, phytophthora				1	1								
blight, crown rot, septoria and			1					1					
brown spot			<b> </b>		- <b> </b>	·+	4		<b>.</b>	<b>_</b>		1	- -
Other operations			<b> </b>	<u> </u>	<b> </b>				<b>.</b>		<u> </u>		4_
5.1 Dead and diseased vines has to be			1	1 *	1			•			1	1 *	1
removed, replanted at least 2 m away					+		<b>_</b>	- <u> </u>		<b>_</b>	<u> </u>	<b>_</b>	1-
5.2 Dry and dead vines has to be			1	*				*				1 *	1
prunned and burnt			<b>_</b>	-	+	- <b>_</b>	- <b> </b>	<u> </u>	- <b> </b>		<u> </u>		1
5.3 If heavy regetative growth happened			1	+				*				*	
some vines of the lower part in touch										1		1	1
with the ground has to be removed			<u> </u>	<u></u>		<u> </u>	1	<u> </u>					
5. Harvesting			. <b>.</b>	<b>_</b>				1.					
6.1 Flowering season, fruit setting								-					T
and maturity	]											_	
6.2 Harvesting season	· T		1	1	1	1	1		1	1	4		- T

Operation	Year	Apr.	May	່ງດີ.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar
Non Bearing Tree													
1. Planting													
1.1 Variety:													
- Brahrang						l l							
- Binjai													
- Lebakbulus													
- Rapeah													
1.2 In the beginning of rainy	~ ~		·					*					
season. Or any time if there is				1									
available economically water													
to be watering													
1.3 The young tree needs shading				T					_				
and watering if no rain				1									
(3-5 liter/tree/day)				L	ļ	ļ				ļ	ļ	L	<b> </b>
2. Fertilization					L							ļ	L
2.1 Soil conditioner					1			*				1	
If soil pH below 5.5 adjust													
with lime at rate of 2.5-3.5						ļ					1	1	i.
ton/ha; at least each 5 years			<b>_</b>	ļ	<b> </b>	<b> </b>	<b>_</b>		ļ				
2.2 Organic manure (per tree)			i		i i	1	1					l I	
First application as basic													
fertilization in planting time;					1		1					l I	
the next will be in rainy													
season								+					
2.2.1 15 kg farmyard manure	1				1					١.			
20 kg farmyard manure	2									1.			
30 kg farmyard manure	3												
35 kg farmyard manure	4	<b></b>	<b> </b>			╂		┨	┣	<b>↓</b> <u> </u>	╄	<u> </u>	┣
2.3 Inorganic fertilizer (per tree)							1						
Twice a year at the beginning													
and the end of rainy season		<u> </u>	╂───		<b></b>	d	+			+		<b>!</b>	+
2.3.1 Urea 40 g	1						*					1	.
50 g	2	j		1									
60 g	3							•					
75 g					+	+		<b>}</b>		+	-		*
2.3.2 TSP 25 g	l				i i	1							
30 g	2												
40 g	3												
100 g	4			<b>.</b>						┫	-	·	
2.3.3 KCł 75 g	1	1			1		*		1	1			1
80 g	2		1				*	1		1	i	1	*
90 g	1		ļ			Į	*		ł				1
100 g	4	l	<u> </u>			_	*			₋			*
3. Irrigation					Ì								
If no rain the tree needs watering				1									
20-25 liter/tree/day		<u> </u>					<u> </u>	<u>+</u>	╂		_	-	
3.1 Dry season		<b>F</b>	+	1				۳	<u> </u>			. <b> </b>	
3.2 Rainy season				<u> </u>					1	1			
4. Pest control (each year)			Í	*		1		*			i	*	
Spray with insecticide and	.1			1		1							
fungicide to control/to prevent from		1								1		1	
- insect and catterpillars attack leave	re,	1	l				1				1	l l	1
flower, fruit and shoot									1				
<ul> <li>powdary nutdew</li> </ul>		–	- <b>-</b>	+								- <b>-</b>	
5. Other operations			-}	+	- <b> </b>				+			<u> </u>	+
5.1 Soil under the crown has to be	;			*	1	1		*				*	
chopped		-		+-			- <b> </b>	<u> </u>				-	
5.2 Dry and dead twig has to be			1	*				*				*	
prunned and burnt						1		1	1		1	1	1

### Table B-4-12 Rambutan Management Calendar (1/2)

	Operation	Year	Apr.	May	Jon.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar
	ng Tree													L
	ilization		L											
1.1	Soil conditioner		1											
	In the six year old, apply the	5				i								
	second liming at the rate of	6 7						1	*					
	2.5-3.5 ton/ha. in rainy season													l I
		8											1	l I
		9												
1.2	Organic manure (per tree)													
	Apply once a year in rainy													
	season				1			i						
	1.2.1 40 kg farmyard manure	5									*			[
	60 kg farmyard manure	6								Į	*			
	70 kg farmyard manure	7		]							*			
	80 kg farmyard manure	8		1							+			
	90 kg farmyard manure	9			1						*			I I
	100 kg farmyard manure	10		1	i i						*			
13	Inorganic fertilizer (per tree)		1		1	1	1	1	1					
	Twice a year, in the beginning								1					1
	and the end of rainy season				i i								1	
	1.3.1 Urea 85 g	5	;	1	<u> </u>	1	1	*	1		1			*
	125 g	e						*						*
	175 g	7			1			*			•			*
	225 g	8	3					*		i	1		1	*
	275 g	ç					1	*			1			*
	335 g	10	1					*						*
	1.3.2 TSP 50 g	4	_	1	1			*		1	-	1	1	*
	60 g		5					+						*
	75 g		,					*						*
	85 g	8	3					*						*
	105 g		2					*						*
	125 g	10	5	ļ				*		ļ				
	1.3.3 KCl 110 g		5	1	1			*					1	1 *
	150 g		5			1		*						*
	175 g		7		1			*						
	200 g	1	B					*		]		1		1
	225 g	•	9					*	1				ł	
	250 g	14						*			1			*
2.10	igation		1	1	-	1	1			1	1		1	1
Si	milar to the nonbearing plant		1										ļ	
	Dry season				1			1-1			1		1	
	2 Rainy season		1			1	+	1	-	1		-		╪
	st control			- <u> </u>	*	- <b>[</b>		1	*	-		1	*	1
1	milar to the non bearing plant				1									1.
	her operation		1-	1	*	1	1	1	*		1	1	*	+
	milar to the non bearing plant					1						ł		
	arvesting		+	+	+	1	1	1	1	1	1	1	1	+
	Flowering season, fruit setting		+	-	+-	+							-1	1
	and maturity			ł					1			1		
	2 Harvesting season			+	+	+	+	+		+	1		1	$\pm$
	e initiating account											l.		1
			1	<u> </u>		<u></u>		_ <b>L</b>	<b></b>		1		<u></u>	<u> </u>

## Table B-4-12 Rambutan Management Calendar (2/2)

Operation	Year	Apr.	May	. <b>ม</b> ุญก.	Jul.	Aug.	Sep.	0ct.	Nov.	Dec.	Jan.	Feb.	Ma
. Non Bearing Plant									<u>_</u>				
I. Planting										" — — .			<u> </u>
1.1 Variety:													
- local variety							ļ						1
- Suwaru							i						
- Pondoh													
1.2 In the beginning of rainy								*	[				
season. Or any time if there is													ļ
available economically water										1			
to be watering							]						ļ
1.3 The young tree needs shading			<u> </u>			1	1		1		<b></b>		
and watering if no rain													
(3-5 liter/tree/day)					ļ	1							
2. Fertilization		<b> </b>			<u>+</u>		<u>+</u>		1		1		
2.1 Soil conditioner			·		<u> </u>			*	<u> </u>		<u>†</u> —-		<u> </u>
1 1		!											
If soil pH below 5.5 adjust						1	ł		ļ			ļ .	
with lime at rate of 2.5-3.5					1				1				
ton/ha; at least each 5 years	·	┨	<u> </u>	┣				<b> </b>	<u> </u>		<u> </u>	1	
2.2 Organic manute (per tree)		1	1	1	1		ļ	1	1		1	1	1
First application as basic						1	1						
fertilization in planting time;			ļ		1				1				
the next will be in rainy								1	1				
season		╂—		┨	┨	<b>!</b>		*	┨───	+			╁──
2.2.1 10 kg farmyard manure	1				1				1		1		
12.5 kg farmyard manure	1	2					1						
15 kg farmyard manure		<u>اا</u>	+		- <b> </b>				}	<u>+-</u> -	+	+	+
2.3 Inorganic fertilizer (per tree)													
Twice a year at the beginning					1								
and the end of rainy season				+	+		*	- <b>-</b>					+;
2.3.1 Urea 18.5 g		ł	ļ										
22.5 g		2											
<u>28.5 g</u>		과			<b>_</b>		*						
2.3.2 TSP 25 g		1								1			
30 g		2					1						
37.5 g		3			1_		*		- <b> </b>				+-
2.3.3 KCl 12.5 g		1	1				*			1			
18.5 g		2					*						
25 g		3					*		- <b> </b>	<u> </u>			
3. Irrigation		ļ	1										
If no rain the tree needs watering											1	1	
20-25 liter/tree/day							_			_			
3.1 Dry season		-	-	1-			<u> </u>	<u>×</u>	-	_			
3.2 Rainy season					<u> </u>			_		1	-		+
4. Pest control (each year)			Į	*				*				*	
Apply insecticide and fungicide													
to control/to prevent from		Í		1				1		Į			
- weevil					· [			1					
- pink disease			1								1		
5. Other operations		1	1				T	1					
5.1 Dry and dead leaf has to be			+-	*	1-		1-	*		1	T	*	T
prunned		1								1	1		i
5.2 Pruning gives good aeration,		1		+				*	_	-1		*	Ť
induce flower formation and pu	кħ					·				1			
down investation of the disease		i	1		1	ł		Į					
oown investation of the disease	.s	ł						1					

# Table B-4-13 Sałak Management Calendar (1/2)

Similar to the non bearing plant	Operat		Year	Αρι.	May	Jun.	Jul.	Auz	Sep.	Oct	Nov.	Dec.	Jon.	Feb.	Ma
1.1 Soil conditioner       4         After 5 years apply second       4         timing at the rated 2.5.3.5       5         toncha in the ratiny season       7         9       10         1.2 Organic manure (per tree)       7         Apply once a year in rainy       5         20 kg farmyard manure       4         2.1 17.5 kg farmyard manure       5         20 kg farmyard manure       6         20 kg farmyard manure       7         20 kg farmyard manure       8         20 kg farmyard manure       8         20 kg farmyard manure       9         30 the end of rainy season       9         1.3.1 Urea       17.5 g         35 g       7         35 g       9         35 g       9         4.3.2 TSP       4.5 g         50 g       5         50 g       9         50 g       9											~			~	
After 5 years apply second thing at the rated 2 5-3.5 towha in the ratiny season 1.2 Organic manure (per tree) Apply once a year in rainy season 1.2.1 17.5 kg farmyard manure 20 kg farmyard manure 20 kg farmyard manure 20 kg farmyard manure 20 kg farmyard manure 20 kg farmyard manure 20 kg farmyard manure 20 kg farmyard manure 20 kg farmyard manure 20 kg farmyard manure 20 kg farmyard manure 20 kg farmyard manure 20 kg farmyard manure 30 kg farmyard manure 4 20 kg farmyard manure 5 20 kg farmyard manure 30 kg farmyard manure 4 20 kg farmyard manure 5 20 kg farmyard manure 9 20 kg									·						
timing at the rated 2.5-3.5       5         ton/ha in the ratiny season       7         8       9         1.2       Organic manure (per tree)         Apply once a year in rainy       9         1.2.17.5 kg farmyard manure       4         2.0 kg farmyard manure       5         2.0 kg farmyard manure       6         2.0 kg farmyard manure       6         2.0 kg farmyard manure       7         2.0 kg farmyard manure       8         2.0 kg farmyard manure       9         3.1 Urca it 7.5 g       4         4       1.3.1 Urca         3.5 g       7         3.5 g       9         3.5 g <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>															
ton/ha in the rainy season         6           7         8           9         10           1.2         Organic manure (per tree)           Apply once a year in rainy         •           20 kg farmyard manure         •           1.3 Inorganic ferilitzer (per tree)         •           Twice speci, In the beginning         •           and the end of rainy season         •           35 g         •           35 g         •           35 g         •           35 g         •           1.3.1 Urea         17 S g           35 g         •           50 g         •           50 g         •           50 g         •           50 g	After 5	5 years apply second													
7         8         10															
8         9           10         10           11         10           12         Organic manure (per tree)           Apply once a year in rainy         *           20 kg farmyard manure         *           1.3.1 Urea         10.7.5 g           35 g         *           36 g         *           37 Sg         *           38 g         *           39 g         *           1.3.1 Urea         17.5 g           37 Sg         *           38 g         *           39 g         *           1.3.2 TSP         43.5 g           50 g         5           50 g         5           1.3.2 TSP         5.3 g           50 g         *           50 g         *           50 g         *           50	ton/ha	in the rainy season								*				Í	
9         10           1.2         Organic manure (per tree)           Apply once a year in tainy         season           1.2.1         17 5 kg famyard manure           20 kg farmyard manure         •           31 Inorganic fertilizer (per tree)         •           Twice a year, in the beginning         •           31 Urea         17.5 g           32 g         •           33 g         •           35 g         •           35 g         •           35 g         •           35 g         •           35 g         •           35 g         •           35 g         •           35 g         •           35 g         •           50 g         •															
10         10           1.2 Organic manure (per tree) Apply once a year in rainy season         1           12.1 17 5 kg famnyard manure 5 20 kg famnyard manure 6 20 kg famnyard manure 7 20 kg famnyard manure 7 20 kg famnyard manure 9         •           1.3 thorganic ferilitzer (per tree) Twice a year, in the beginning and the end of rainy season         •         •           1.3.1 Urea 17.5 g         •         •         •           1.3.2 TSP         35 g         •         •           1.3.1 Urea 20 g         5         •         •           1.3.1 Urea 17.5 g         •         •         •           1.3.2 TSP         43.5 g         •         •           1.3.2 TSP         43.5 g         •         •           1.3.2 TSP         43.5 g         •         •           1.3.3 KC1         30 g         4         •         •           1.3.3 KC1         30 g         •         •         •									1						
1.2       Organic manure (per tree)         Apply once a year in rainy         scatson         1.2.1       17.5 kg farmyard manure         4       20 kg farmyard manure         20 kg farmyard manure       *         1.3       Inceganic Kriffizer (per tree)         Twice a year, in the beginning       *         and the end of rainy season       *         and the end of rainy season       *         35 g       8         35 g       9         35 g       8         35 g       9         1.3.1       Urea         1.3.2       TSP         43.5 g       4         50 g       5         50 g       6         50 g       9								1							
Apply once a year in rainy season  1.2.1 17.5 kg farmyard manure  2.0 kg farmyard manure  2.0 kg farmyard manure  2.0 kg farmyard manure  2.0 kg farmyard manure  2.0 kg farmyard manure  3.2 0 kg farmyard manure  4.  2.0 kg farmyard manure  5.1  2.0 kg farmyard manure  5.1  2.0 kg farmyard manure  5.1  2.0 kg farmyard manure  5.1  2.0 kg farmyard manure  5.1  2.0 kg farmyard manure  5.1  2.0 kg farmyard manure  5.1  2.0 kg farmyard manure  5.1  2.0 kg farmyard manure  5.1  2.0 kg farmyard manure  5.1  2.0 kg farmyard manure  5.1  2.0 kg farmyard manure  5.1  2.1  2.1  2.1  2.1  2.2  2.1  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2.2  2															
scason     4     4       12.1     17.5 kg famyard manure     4       20 kg famyard manure     5       20 kg farnyard manure     6       20 kg farnyard manure     7       20 kg farnyard manure     8       20 kg farnyard manure     9       30 ke end of rainy season     9       35 g     7       35 g     7       35 g     8       35 g     9       1.3.2 TSP     43.5 g       50 g     5       50 g     6       50 g     9       1.3.3 KC1     30 g       43.5 g     7       43.5 g     7       43.5 g     7       43.5 g     7															
1.2.1       17.5 kg farmyard manure       4         20 kg farmyard manure       6         20 kg farmyard manure       7         20 kg farmyard manure       8         20 kg farmyard manure       9         30 kg farmyard manure       9         30 kg farmyard manure       9         1.3.1 word manure       9         31 kord sage       7         35 g       7         35 g       7         35 g       9         35 g       9         43.5 g       10         1.3.1 Word       30 g         43.5 g       10         1.3.3 KCl       30 g         4		-													ļ
20 kg fannyad manure       6       •         20 kg fannyad manure       6       •         20 kg farnyad manure       7         20 kg farnyad manure       •         1.3 horganic Krittiker (per tree)       •         Twice a year, in the beginning       •         and the end of rainy scason       •         1.3.1 Urea       17.5 g       4         20 g       5       •         35 g       6       •         35 g       9       •         35 g       9       •         35 g       9       •         1.3.2 TSP       43.5 g       4         50 g       6       •         50 g       7       •         50 g       9       •         43.5 g       9       • <td></td> <td></td> <td></td> <td></td> <td><b> </b></td> <td></td> <td><b> </b></td> <td></td> <td></td> <td><u>-</u>-</td> <td>•••••</td> <td><b> </b></td> <td><b> </b></td> <td><b>-</b></td> <td><b> </b></td>					<b> </b>		<b> </b>			<u>-</u> -	•••••	<b> </b>	<b> </b>	<b>-</b>	<b> </b>
20 kg farmyad manure       6         20 kg farmyad manure       7         20 kg farmyad manure       8         20 kg farmyad manure       9         20 kg farmyad manure       9         1.3 Inorganic ferilizer (per tree)       *         Twice a year, in the beginning       *         and the end of rainy seasen       *         1.3.1 Urea       17.5 g         20 g       5         35 g       8         35 g       7         35 g       8         35 g       8         35 g       8         35 g       8         35 g       9         1.3.2 TSP       43 5 g         50 g       5         50 g       6         50 g       9         50 g       9         1.3.3 KC1       30 g         43 5 g       9         43 5 g       9         43 5 g       9         43 5 g       9													i i		1
20 kg farmyard manure         9         *           1.3 thorspace         10         *           1.3.2 TSP         43.5 g         4           50 g         50 g         *           50 g         10         *           1.3.3 KCl         30 g         *           50 g         50 g         *           50 g         10         *           1.3.3 KCl         30 g         *           43.5 g         6         *           43.5 g         9         *           43.5 g         <															
20 kg farmyard manure         9         *           1.3 Inorganic fertilizer (per tree)         *         *           Twice a year, in the beginning and the end of rainy season         *         *           1.3.1 Urea         17.5 g         4         *           1.3.1 Urea         17.5 g         4         *         *           1.3.1 Urea         17.5 g         4         *         *           1.3.1 Urea         17.5 g         4         *         *           3.5 g         8         *         *         *           3.5 g         9         *         *         *           .3.2 TSP         43.5 g         4         *         *           50 g         50 g         *         *         *           50 g         9         *         *         *           50 g         10         *         *         *           1.3.3 KCl         30 g         *         *         *           43.5 g         6         *         *         *           43.5 g         9         *         *         *           43.5 g         9         *         *         *			0											]	1
20 kg farmyard manure         9         *           1.3 Inorganic fertilizer (per tree)         *         *           Twice a year, in the beginning and the end of rainy season         *         *           1.3.1 Urea         17.5 g         4         *           1.3.1 Urea         17.5 g         4         *         *           1.3.1 Urea         17.5 g         4         *         *           1.3.1 Urea         17.5 g         4         *         *           3.5 g         8         *         *         *           3.5 g         9         *         *         *           .3.2 TSP         43.5 g         4         *         *           50 g         50 g         *         *         *           50 g         9         *         *         *           50 g         10         *         *         *           1.3.3 KCl         30 g         *         *         *           43.5 g         6         *         *         *           43.5 g         9         *         *         *           43.5 g         9         *         *         *				1			1								
20 kg farmyard manure         0         *           1.3 Inorganic fcrillizer (per tree)         *         *           Twice a year, in the beginning         and the end of rainy season         *         *           1.3.1 Urea         17.5 g         4         *         *           20 g         5         *         *         *           35 g         6         *         *         *           35 g         7         *         *         *           35 g         8         *         *         *           35 g         9         *         *         *           35 g         9         *         *         *           1.3.2 TSP         43.5 g         4         *         *           50 g         50 g         6         *         *           50 g         9         *         *         *           43.5 g         6         *         *         *           43.										*					
1.3 Inorganic fertilizer (per tree)         Twice a year, in the beginning         and the end of rainy season         1.3.1 Urea         1.3.1 Urea         20 g         35 g         35 g         35 g         35 g         35 g         35 g         35 g         35 g         35 g         35 g         35 g         35 g         35 g         35 g         35 g         35 g         35 g         1.3.2 TSP         43.5 g         50 g         50 g         50 g         50 g         50 g         50 g         50 g         50 g         43.5 g         43.5 g         43.5 g         43.5 g         43.5 g         1.1.1 Dry season         2.1 Dry season         2.2 Rainy season         3.2 Rest control         Similar to the non bearing plant         4.10 Dry season         2.2 Rainy season         3.1 Dry season         3.2 S							ļ			*					
Twice a year, in the beginning and the end of rainy season										<u> </u>					┢─
and the end of rainy season       1.3.1 Urea       17.5 g       4       *       *         1.3.1 Urea       17.5 g       4       *       *       *       *         35 g       6       *       *       *       *       *       *         35 g       7       *       *       *       *       *       *         35 g       9       *       *       *       *       *       *         1.3.2 TSP       43.5 g       4       *       *       *       *       *         1.3.2 TSP       43.5 g       4       *       *       *       *       *       *         1.3.2 TSP       43.5 g       4       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *				1			]						•		
1.3.1 Urea       17.5 g       4       *       *         20 g       5       35 g       *       *       *         35 g       7       35 g       *       *       *         35 g       7       *       *       *       *         1.3.2 TSP       43.5 g       4       *       *       *         50 g       50 g       6       *       *       *       *         1.3.2 TSP       43.5 g       7       *       *       *       *         50 g       50 g       7       *       *       *       *         1.3.3 KC1       30 g       4       *       *       *       *       *         1.3.3 KC1       30 g       4       *       *       *       *       *         1.3.3 kS g       9       *       *       *       *       *       *         2. Iris tains galant       *								1							
20 g       5       *       *         35 g       6       *       *         35 g       8       *       *         35 g       8       *       *         1.3.2 TSP       43.5 g       *       *         1.3.2 TSP       43.5 g       *       *         50 g       5       *       *         50 g       5       *       *         50 g       8       *       *         50 g       8       *       *         50 g       9       *       *         50 g       10       *       *         1.3.3 KCl       30 g       4       *         37.5 g       5       *       *         43.5 g       6       *       *         43.5 g       8       *       *         2. Irrigation       *       *       *         similar to the nonbearing plant       *       *       *         2.1 Dy season       *       *       *       *         3.1 Pest control       *       *       *       *         Similar to the non bearing plant       *       *       * </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td><u> </u></td> <td><b> </b></td> <td>Ļ</td> <td>ļ</td> <td>ļ</td> <td><b> </b></td> <td>ļ</td> <td><b>i</b></td> <td><b>—</b></td>							<u> </u>	<b> </b>	Ļ	ļ	ļ	<b> </b>	ļ	<b>i</b>	<b>—</b>
35 g       6         35 g       7         35 g       7         35 g       9         35 g       9         35 g       9         1.3.2 TSP       43.5 g         50 g       5         50 g       6         50 g       6         50 g       7         50 g       7         50 g       9         43.5 g       6         43.5 g       9         5.1 Dyseason       4         2.2 Rainy season       4         3. Pest control       *	1.3.1								*						
35 g       7       *       *         35 g       8       *       *         35 g       9       *       *         1.3.2 TSP       43.5 g       4       *         50 g       50 g       6       *         50 g       50 g       9       *         50 g       9       *       *         50 g       9       *       *         50 g       9       *       *         1.3.3 KCl       30 g       4       *         1.3.3 kSl       9       *       *         43.5 g       7       *       *         43.5 g       9       *       *         2. Irrigation       *       *       *         Similar to the nonbearing plant       *       *       *         3. Pest control       *       *       *         Simil			5		1										
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$			0				]								
$35 g$ $9$ $*$ $1.3.2 \text{ TSP}$ $43.5 g$ $4$ $1.3.2 \text{ TSP}$ $43.5 g$ $*$ $50 g$ $50 g$ $6$ $50 g$ $6$ $*$ $50 g$ $7$ $*$ $50 g$ $9$ $*$ $50 g$ $9$ $*$ $1.3.3 \text{ KCl}$ $30 g$ $4$ $1.3.3 \text{ KCl}$ $30 g$ $4$ $43.5 g$ $7$ $*$ $43.5 g$ $7$ $*$ $43.5 g$ $7$ $*$ $43.5 g$ $7$ $*$ $43.5 g$ $10$ $*$ $2. \text{ frigation Similar to the nonbearing plant       43.5 g 6 2.1 \text{ Dry season} 2 4 * 2.2 \text{ Rainy season} 4 4 3. \text{ Pest control} * * * 5.1 \text{ Flowering season, fruit setting and maturity       4 4 5.1 \text{ Flowering season, fruit setting and maturity       4 4 5.2 \text{ Second thinning} 4 4$		35 g	1	Į.											
35 g       10       *         1.3.2 TSP       43.5 g       4         50 g       50 g       *         50 g       6       *         50 g       7       *         50 g       7       *         50 g       9       *         50 g       9       *         50 g       10       *         1.3.3 KCl       30 g       4         37.5 g       5       *         43.5 g       6       *         43.5 g       8       *         43.5 g       9       *         43.5 g       9       *         2. Irrigation       *       *         Similar to the nonbearing plant       *         2.1 Dry season       *       *         3. Pest control       *       *         Similar to the non bearing plant       *       *         4.1 Other operation       *       *         Similar to the non bearing plant       *       *         5.1 Flowering season, fruit setting       *       *         5.2 Fruit thinning       *       *         5.2.1 Eirst thinning       *       *			8				]		11		· ·				
1.3.2 TSP       43.5 g       4         50 g       50 g       6         50 g       7         50 g       8         50 g       9         1.3.3 KC1       30 g         1.3.3 KC1       30 g         41 37.5 g       4         50 g       9         43.5 g       4         43.5 g       4         43.5 g       7         43.5 g       4         43.5 g       9         43.5 g       9         43.5 g       10         2. Irrigation       43.5 g         Similar to the nonbearing plant       4         2.1 Dy season       4         2.2 Rainy season       4         3. Pest control       *         Similar to the non bearing plant       *         4. Other operation       *         Similar to the non bearing plant       *         4. Other operation       *         Similar to the non bearing plant       *         5.1 Howering season, fuit setting       4         3.2 Fruit thinning       5         5.2.1 First thinning       5         5.2.2 Second thinning       *							ł		L T						
S0 g       5         S0 g       6         S0 g       7         S0 g       7         S0 g       8         S0 g       8         S0 g       9         S0 g       9         S0 g       9         S0 g       9         S0 g       10         I.3.3 KCl       30 g         A3.5 g       4         A3.5 g       4         A3.5 g       8         43.5 g       9         A3.5 g       8         A3.5 g       9         A3.5 g       9         A3.5 g       9         A3.5 g       10         Irrigation       *         Similar to the nonbearing plant       *         2.1 Dry season       *         2.2 Rainy season       *         3. Pest control       *         Similar to the non bearing plant       *         4. Other operation       *         Similar to the non bearing plant       *         5.1 Howering season, fruit setting       *         and maturity       *         5.2 Fruit thinning       *         S.2. Se	1							<b>↓</b>		<u> </u>	<i>·</i>			<b> </b>	-
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	1.3.2									1					
S0 g       7       *       *         50 g       9       *       *         50 g       9       *       *         1.3.3 KC1       30 g       4       *         1.3.3 KC1       30 g       4       *         1.3.3 KC1       30 g       4       *         43.5 g       6       *       *         43.5 g       8       *       *         43.5 g       9       *       *         43.5 g       9       *       *         43.5 g       9       *       *         2.1 frigation       *       *       *         Similar to the nonbearing plant       *       *       *         2.1 Dry season       *       *       *         2.2 Rainy season       *       *       *         3. Pest control       *       *       *         Similar to the non bearing plant       *       *       *         4. Other operation       *       *       *         5. Harvesting       *       *       *       *         5.1 Flowering season, fruit setting       *       *       *         5.2 Froit thi	1								*	1			1		
50 g       8       *       *         1.3.3 KCl       30 g       4       *         1.3.5 g       5       *       *         43.5 g       7       *       *         43.5 g       9       *       *         43.5 g       10       *       *         2. Irrigation       Similar to the nonbearing plant       *       *         2.1 Dry season       *       *       *         2.2 Rainy season       *       *       *         3. Pest control       *       *       *         Similar to the non bearing plant       *       *       *         4. Other operation       *       *       *       *         5. Harvesting       *       *       *       *         5.1 Flowering season, fruit setting       *       *       <		50 g 50 g	2	1											
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$		50 g								i					
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$			0						*						
1.3.3 KCl       30 g       4       *       *         37.5 g       5       *       *       *         43.5 g       6       *       *       *         43.5 g       8       *       *       *         43.5 g       8       *       *       *         43.5 g       9       *       *       *         2. Irrigation       *       *       *       *         Similar to the nonbearing plant       *       *       *       *         2.1 Dry season       *       *       *       *       *         3. Pest control       *       *       *       *       *       *         3. Pest control       *       *       *       *       *       *       *         4. Other operation       *       *       *       *       *       *       *       *         5. Harvesting       *       *       *       *       *       *       *       *         5.1 Flowering season, fauit setting       *       *       *       *       *       *       *       *       *       *       *       *       *       * <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>*</td> <td></td> <td></td> <td></td> <td></td> <td>1</td> <td>1</td>									*					1	1
37.5 g       5       *       *         43.5 g       6       *       *         43.5 g       7       *       *         43.5 g       9       *       *         43.5 g       9       *       *         2. Irrigation       Similar to the nonbearing plant       *       *         2.1 Dty season       *       *       *         2.2 Rainy season       *       *       *         3. Pest controt       *       *       *         3. Pest controt       *       *       *         Similar to the non bearing plant       *       *       *         4. Other operation       *       *       *       *         5.1 Harvesting       *       *       *       *         5.1 Flowering season, fault setting       *       *       *         and maturity       *       *       *       *         5.2.1 First thinning       *       *       *       *	1 2 2				ł	1		+	+		<u> </u>		+	+	╋
43.5 g       6         43.5 g       7         43.5 g       7         43.5 g       8         43.5 g       9         5.1 Flowering season, fruit setting and maturity       9         5.1 Flowering season, fruit setting and maturity       9         5.2 Fruit thinning       *         5.2.1 First thinning       *         5.2.2 Second thinning       *	1.5.5											i	1		
43.5 g       7         43.5 g       8         43.5 g       9         43.5 g       10         2. Irrigation       *         Similar to the nonbearing plant       *         2.1 Dry season       *         2.2 Rainy season       *         3. Pest control       *         Similar to the non bearing plant       *         4. Other operation       *         Similar to the non bearing plant       *         5. Harvesting       *         5.1 Flowering season, fruit setting       *         and maturity       *         5.2 Fruit thinning       *         5.2.1 First thinning       *         5.2.2 Second thinning       *									*						
43.5 g       8       *       *         43.5 g       9       *       *         2. Irrigation       Similar to the nonbearing plant       *       *         2.1 Dry season       •       •       •         2.2 Rainy season       •       •       •         3. Pest control       *       *       *         Similar to the non bearing plant       *       *       *         4. Other operation       *       *       *         Similar to the non bearing plant       *       *       *         5. Harvesting       •       •       •         5.1 Flowering season, fruit setting       •       •       •         5.2 Fruit thinning       *       •       •         5.2.1 First thinning       *       *       •							1	1	*						
43.5 g       9       *       *         2. Irrigation       Similar to the nonbearing plant       *       *         2.1 Dry season       •       •       •         2.2 Rainy season       •       •       •         3. Pest control       •       •       •         Similar to the non bearing plant       *       *       *         4. Other operation       *       *       *         Similar to the non bearing plant       *       *       *         5. Harvesting       •       •       •         5.1 Flowering season, fruit setting       •       •       •         5.2 Fruit thinning       *       *       •       •         5.2.1 First thinning       *       •       •       •							1		*					1	
43.5 g       10       *         2. Irrigation       Similar to the nonbearing plant       *         2.1 Dry season       *       *         2.2 Rainy season       *       *         3. Pest control       *       *         Similar to the non bearing plant       *       *         4. Other operation       *       *         Similar to the non bearing plant       *       *         5. Harvesting       *       *         5.1 Flowering season, fruit setting       *       *         5.2 Fruit thinning       *       *         5.2.1 First thinning       *       *			-						*						
2. Irrigation       Similar to the nonbearing plant       Image: Season         2.1 Dry season       Image: Season       Image: Season         2.2 Rainy season       Image: Season       Image: Season         3. Pest control       Image: Season       Image: Season         3. Pest control       Image: Season       Image: Season         4. Other operation       Image: Season       Image: Season         5. Harvesting       Image: Season, fruit setting       Image: Season, fruit setting         5.1 Flowering season, fruit setting       Image: Season, fruit setting       Image: Season         5.2 Fruit thinning       Image: Season       Image: Season       Image: Season         5.2.1 First thinning       Image: Season       Image: Season       Image: Season         5.2.2 Second thinning       Image: Season       Image: Season       Image: Season									*		1				
Similar to the nonbearing plant       Image: Control search of the nonbearing plant         2.2 Rainy season       Image: Control search of the nonbearing plant         3. Pest control similar to the non bearing plant       Image: Control search of the nonbearing plant         4. Other operation similar to the non bearing plant       Image: Control search of the nonbearing plant         5. Harvesting       Image: Control search of the nonbearing plant         5.1 Flowering season, fruit setting and maturity       Image: Control search of the nonbearing plant         5.2 Fruit thinning       Image: Control search of the nonbearing plant         5.2.1 First thinning       Image: Control search of the nonbearing plant	igation							1	1		1			1	
2.1 Dry season       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •		the nonbearing plant		1										ļ	
2.2 Rainy season       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •       •				-	-			1			1	1	1	1	$\mathbf{T}$
3. Pest control       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *				-	1		1-	<b>†</b>		4	1	1		<u> </u>	T
Similar to the non bearing plant       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *				1	1	*	1		<u>†</u>		1			1 1	ϯ╌
4. Other operation       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *       *				1			1	1	1	1	1			1	
Similar to the non bearing plant       Image: Similar to the non bearing plant         5. Harvesting       Image: Similar to the non bearing plant         5.1 Flowering season, fruit setting and maturity       Image: Similar to the non bearing plant         5.2 Fruit thinning       Image: Similar to the non bearing plant         5.2 Fruit thinning       Image: Similar to the non bearing plant         5.2 Fruit thinning       Image: Similar to the non bearing plant         5.2.2 Second thinning       Image: Similar to the non bearing plant					1	*	1	+	-	*	<u>+</u>		+	++	╉
5. Harvesting								ļ			1	1			1
5.1 Flowering season, fait setting and maturity       5.2 Fruit thinning       5.2.1 First thinning       5.2.2 Second thinning							╂	+		+	+				+
and maturity     5.2 Fruit thinning       5.2 First thinning     *       5.2.2 Second thinning     *						<u> </u>	<u> </u>				<del></del>		+	+	
5.2         Fruit thinning         *           5.2.1         First thinning         *           5.2.2         Second thinning         *								T			1				
5.2.1 First thinning   *     5.2.2 Second thinning   *				<b></b>		+	+	+						1	+-
5.2.2 Second thinning *							+	+			<b> </b>	4		<b> </b>	1
							*		∔	1	<b> </b>				1
5.2.3 Third thinning								*							
						L.			*			<u> </u>			Г
5.3 Harvesting season	3 Harv	esting season					1				<b></b>				+

### Table B-4-13 Salak Management Calendar (2/2)

Table B-4-14 Annual Labor	Requirement by Farming Practice (1/9)	
---------------------------	---------------------------------------	--

ļ

Item	Farming Practice		Requir	ement
		Family	Hired	Total
ist year		-		
L Land Finishing	Finishing of land after preparation		8.0	8.0
2. Land cultivation	Plowing		8.0	8,0
3. Holes preparation	Digging of holes with a size of $0.6 \ge 0.6 \ge 0.6$ m		12.0	12.0
1. Manuring	Putting of organic manure into holes	••	20.0	20.0
5. Planting	Planting of seedlings with a distance of 10 x 10 m	8.0		8.0
6. Fertilizing	Applying of basic fertilizers	2.6		2.6
-	Total	10.6	48.0	58.6
2nd year				
1. Fertilizing	Applying of fertilizers and soil conditioner	4.1		4.1
2. Pest control	Applying of agro-chemicals (when necessary)		16.0	16.0
3. Weed control	Weeding of land surface	8.0		8,0
4. Water supply	Watering to fruit trees	40.0		40.0
5. Supplemental planting	Planting of supplemental seedlings with			
	manure and fertilizers		8.6	
	Total	52.1	24.6	76.
<u>3rd year</u>				
1. Fertilizing	Applying of fertilizers (twice a year)	5.8		5.8
2. Pest control	Applying of agro-chemicals (when necessary)		8.0	
3. Weed control	Weeding of land surface	8.0		8.0
4. Water supply	Watering to fruit trees	20.0	1	20.0
	Total	33.8	8.0	41,8
<u>4th year</u>				
1. Fertilizing	Applying of fertilizers (twice a year)	9.2	4	9.3
2. Pest control	Applying of agro-chemicals (when necessary)		8,0	
3. Weed control	Weeding of land surface	8.0		8.
<ol> <li>Water supply</li> </ol>	Watering to fruit trees	20.0		20.
	Total	37.2	8.0	45.
5th year			Ì	
1. Fertilizing	Applying of fertilizers	12.0		12.
2. Pest control	Applying of agro-chemicals (when necessary)		8.0	
3. Weed control	Weeding of land surface	8.0		8.
4. Harvesting	Picking of fruits	55.0		- 55
	Total	75.0	8.0	83

Year	Picking	<u>rruits</u>	Other Ac	tivities.
	Family	Hired	Family	Hired
6	75.0	35.0	20.0	8.0
7	75.0	110.0	20.0	8.0
8	75.0	220.0	20.0	8.0
9	75.0	330.0	20.0	8.0
10	75.0	440.0	20.0	8.0
11	75.0	510.0	20.0	8.0
12	75.0	510.0	20.0	8.0

Table B-4-14 Annual Labor F	equirement by Farming Practice (2/9)
-----------------------------	--------------------------------------

ltem	Farming Practice			
		Family	Hired	Total
st year				
. Land Finishing	Finishing of land after preparation		80.0	80.0
2. Land cultivation	Plowing		80.0	80.0
<ol> <li>Holes preparation</li> </ol>	Digging of holes with a size of 0.6 x 0.6 x 0.6 m		100.0	100.0
4. Manuring	Putting of organic manure into holes		120.0	120.0
5. Fertilizing	Applying of basic fertilizers	116.0		116.0
6. Planting	Planting of seedlings with a distance of 2 x 5 m	80.0	••	80.0
	Total	196.0	380.0	576.0
2nd year				
1. Water supply	Watering to fruit trees	120.0		120.
2. Pest control	Applying of agro-chemicals (when necessary)		80.0	80.
3. Weed control	Weeding of land surface	105.0		105.
4. Fertilizing	Applying of fertilizers	101.5		101.
5. Tree maintenance	Trimming and pruning of trees	40.0		40.
6. Fruit bearing control	Thinning and covering of fruits	5.0		5.
7. Harvesting	Cutting of bunches	20.0		20.
_	Total	391.5	80.0	471.
3rd year				
1. Weed control	Weeding of land surface	135.0		135.
2. Fertilizing	Applying of fertilizers	130.5	1	130.
3. Tree maintenance	Trimming and pruning of trees	160.0		160.
4. Fruit bearing control	Thinning and covering of fruits	20.0		20.
5. Harvesting	Cutting of bunches	40.0		40.
	Total	485.5	0.0	485
4th year				
1. Fertilizing	Applying of fertilizers	116.0		116
2. Pest control	Applying of agro-chemicals (when necessary)		40.0	
3. Weed control	Weeding of land surface	120.0	1	120
4. Tree maintenance	Trimming and pruning of trees	160.0		160
5. Fruit bearing control	Thinning and covering of fruits	20.0	1	20
6. Harvesting	Cutting of bunches	40.0		40
7. Replanting	Replanting of seedling with manure and fertilizers		•	104
• •	Total	560.0	40.0	600

ltem	Farming Practice			
i con		Family	Hired	Total
st year				0.0
Land Finishing	Finishing of land after preparation		8.0	8.0
2. Land cultivation	Plowing		8.0	8.0
3. Holes preparation	Digging of holes with a size of $1.0 \ge 1.0 \ge 1.0$	••	20.0	20.0
I. Manuring	Putting of organic manure into holes		12.0	12.0
5. Planting	Planting of seedlings with a distance of 10 x 10	4.8		4.8
6. Fertilizing	Applying of basic fertilizers	8.0		8,0
Ŭ	Total	12.8	48.0	60.8
<u>2nd year</u>				
1. Fertilizing	Applying of fertilizers and soil conditioner	4.2		4.2
2. Pest control	Applying of agro-chemicals (when necessary)		12.0	12.0
3. Weed control	Weeding of land surface	4.0		4,0
4. Water supply	Watering to fruit trees	24.0		24.
5. Supplemental planting	Planting of supplemental seedlings with			
	manure and fertilizers		8.8	8.
	Total	32.2	20.8	53.
<u>3rd year</u>				
1. Fertilizing	Applying of fertilizers (twice a year)	8.4		8.
2. Pest control	Applying of agro-chemicals (when necessary)		8.0	}
3. Weed control	Weeding of land surface	8.0		8.
4. Water supply	Watering to fruit trees	12.0	1	12.
5. Tree maintenance	Trimming and pruning of trees	8.0		8
	Total	36.4	8.0	44.
<u>4th year</u>				1 11
1. Fertilizing	Applying of fertilizers (twice a year)	11.0		
2. Pest control	Applying of agro-chemicals (when necessary)		8.0	8
<ol><li>Weed control</li></ol>	Weeding of land surface	8.0		
4. Tree maintenance	Trimming and pruning of trees	8.0	1	8
5	Total	27.0	8.0	35
<u>Sth year</u>			,	6
1. Fertilizing	Applying of fertilizers	6.8		
2. Pest control	Applying of agro-chemicals (when necessary)		8.0	
<ol><li>Weed control</li></ol>	Weeding of land surface	4.0		4
4. Tree maintenance	Trimming and pruning of trees	8.0	ł	8
5. Harvesting	Picking of fruits	30.0		30
1	Total	48.	8 8.0	) 50

## Table B-4-14 Annual Labor Requirement by Farming Practice (3/9)

Year	Picking	Fruits	Other Ac	tivities.
	Family	Hired	Family	Hired
6	60.0	0.0	18.8	8.0
7	75.0	15.0	18.8	8.0
8	75.0	105.0	18.8	8.0
9	75.0	195.0	18.8	8.0
10	75.0	315.0	18.8	8.0
11	75.0	435.0	18.8	8.0
12	75.0	435.0	18.8	8.0

# Table B-4-14 Annual Labor Requirement by Farming Practice (4/9)

0	1'.		Th I	•
Commo	THV.	•	1111	r1011
	anty	•	E - 11	

Item	Farming Practice			an-day/ha
		Family	Hired	Total
lst year				
L Land Finishing	Finishing of land after preparation		8.0	8.0
2. Land cultivation	Plowing		8.0	
3. Holes preparation	Digging of holes with a size of 0.6 x 0.6 x 0.6 m		12.0	
4. Manuring	Putting of organic manure into holes		20,0	20.0
5. Planting	Planting of seedlings with a distance of 10 x 10 m	8.0		8.0
6. Fertilizing	Applying of basic fertilizers	2.6		2.6
	Total	10.6	48.0	
2nd year				20.0
1. Fertilizing	Applying of fertilizers and soil conditioner	4.1		4.1
2. Pest control	Applying of agro-chemicals (when necessary)		16.0	16.0
3. Weed control	Weeding of land surface	8.0		8.0
4. Water supply	Watering to fruit trees	40.0		40.0
5. Supplemental planting	Planting of supplemental seedlings with			10.0
	manure and fertilizers		8.6	8.6
	Total	52.1	24.6	
<u>3rd year</u>				
1. Fertilizing	Applying of fertilizers (twice a year)	5.8	Ŵ	5.8
2. Pest control	Applying of agro-chemicals (when necessary)		8.0	8.0
3. Weed control	Weeding of land surface	8.0		8.0
<ol> <li>Water supply</li> </ol>	Watering to fruit trees	20.0		20.0
	Total	33.8	8.0	41.8
<u>4th year</u>				
1. Fertilizing	Applying of fertilizers (twice a year)	9.2		9.2
2. Pest control	Applying of agro-chemicals (when necessary)		8	8.0
<ol><li>Weed control</li></ol>	Weeding of land surface	8		8.0
4. Water supply	Watering to fruit trees	20		20.0
	Total	37.2	8.0	45.2
<u>5th year</u>				
1. Fertilizing	Applying of fertilizers	12.0		12.0
2. Pest control	Applying of agro-chemicals (when necessary)		8.0	8.0
3. Weed control	Weeding of land surface	8.0		8.0
4. Harvesting	Picking of fruits	55.0		55,0
	Total	75.0	8.0	83.0

Year	Picking	<u>e Fruits</u>	Other Ac	tivities.
	Family	Hired	Family	Hired
6	75.0	20.0	20.0	8.0
7	75.0	90.0	20.0	8.0
8	75.0	145.0	20.0	8.0
9	75.0	225.0	20.0	8.0
10	75.0	365.0	20.0	8.0
11	75.0	365.0	20.0	8.0
12	75.0	365.0	20.0	8.0

Table B-4-14Annual Labor	Requirement by Farming Practice (5/9)
--------------------------	---------------------------------------

ommodity : Mango	Farming Practice			
Item	Farming Fractice	Family	Hired	Total
st year			8,0	8.0
. Land Finishing	Finishing of land after preparation		8.0	0.0 8.0
. Land cultivation	Plowing		20.0	20.0
. Holes preparation	Digging of holes with a size of $1.0 \ge 1.0 \ge 1.0 =$			12.
Manuring	Putting of organic manure into holes		12,0	4
Planting	Planting of seedlings with a distance of 10 x 10 m	4.8		
. Fertilizing	Applying of basic fertilizers	8.0		8.
	Total	12.8	48.0	60.
Ind year				
. Fertilizing	Applying of fertilizers and soil conditioner	4.2		4.
2. Pest control	Applying of agro-chemicals (when necessary)		12.0	
8. Weed control	Weeding of land surface	4.0		4
4. Water supply	Watering to fruit trees	24,0		24
5. Supplemental planting	Planting of supplemental seedlings with			
	manure and fertilizers		8.8	ι
	Total	32.2	20.8	53
<u>3rd year</u>		8.4		8
1. Fertilizing	Applying of fertilizers (twice a year)	0,4	8.0	1
2. Pest control	Applying of agro-chemicals (when necessary)	8.0	1	
<ol><li>Weed control</li></ol>	Weeding of land surface	12.0		12
4. Water supply	Watering to fruit trees			
5. Tree maintenance	Trimming and pruning of trees	8.0		1
	Total	36.4	8.0	44
4th year		1 11.0		1 11
L. Fertilizing	Applying of fertilizers (twice a year)		8.0	
2. Pest control	Applying of agro-chemicals (when necessary)	8.0		1
<ol><li>Weed control</li></ol>	Weeding of land surface	8.0		
4. Tree maintenance	Trimming and pruning of trees	27.0		1
	Total	213	, o I	<i>,</i> , , , , , , , , , , , , , , , , , ,
<u>5th year</u>		6.	•	
1. Fertilizing	Applying of fertilizers (twice a year)	0.3	8.0	
2. Pest control	Applying of agro-chemicals (when necessary)			
3. Weed control	Weeding of land surface	4.		
4. Tree maintenance	Trimming and pruning of trees	8.		
5. Harvesting	Picking of fruits	30.		
-	Total	48.	8 8.	0 5

Year	Picking	Fruits	Other Ac	tivities.
	Family	Hired	Family	Hired
6	75.0	15.0	18.8	8.0
7	75.0	75.0	18.8	8.0
8	75.0	175.0	18.8	8.0
9	75.0	275.0	18.8	8.0
10	75.0	375.0	18.8	8.0
11	75.0	375.0	18.8	8.0
12	75.0	375.0	18.8	8.0

Table B-4-14 Annual Labor Requirement by Farming Practice (6/9)
-----------------------------------------------------------------

ommodity : <u>Mangosteen</u> Item	Farming Practice			
172.00		Family	Hired	Total
styear			8.0	8.0
Land Finishing	Finishing of land after preparation		8.0	8.0
2. Land cultivation	Plowing		20.0	20.0
3. Holes preparation	Digging of holes with a size of $1.0 \ge 1.0 \ge 1.0 =$		12.0	12.0
4. Manuring	Putting of organic manure into holes	4.8		4.8
5. Planting	Planting of seedlings with a distance of $10 \times 10$ m		1	8.0
6. Fertilizing	Applying of basic fertilizers	8.V		60.8
	Total	12.8	48.0	00.0
2nd year	conditioner	4.2		4.2
1. Fertilizing	Applying of fertilizers and soil conditioner		12.0	12.0
2. Pest control	Applying of agro-chemicals (when necessary)	4.0		4.0
3. Weed control	Weeding of land surface	24.0		24.0
4. Water supply	Watering to fruit trees	21.0		
5. Supplemental planting	Planting of supplemental scedlings with		8.8	8.8
	manure and fertilizers	32.2	1	53.0
	Total	52,6		
<u>3rd year</u>	Applying of fertilizers (twice a year)	8.4		8.4
1. Fertilizing	Applying of agro-chemicals (when necessary)		8.0	8.0
2. Pest control	Applying of agio-chemicals (when necessary)	8.0	) (	8.0
<ol><li>Weed control</li></ol>	Weeding of land surface	12.0	) (	12.0
4. Water supply	Watering to fruit trees	8.0	1	8.0
5. Tree maintenance	Trimming and pruning of trees Total	36.	1	44.4
4th year				
1. Fertilizing	Applying of fertilizers (twice a year)	11.0	I	11.
2. Pest control	Applying of agro-chemicals (when necessary)		8.0	
3. Weed control	Weeding of land surface	8.		8.
4. Tree maintenance	Trimming and pruning of trees	8.		8.
q. Tree manuchance	Total	27.	0 8.0	0 35.
5 th year		6	8	6.
1. Fertilizing	Applying of fertilizers	0.	.0	)
2. Pest control	Applying of agro-chemicals (when necessary)			4
3. Weed control	Weeding of land surface	u	0.	8
4. Tree maintenance	Trimming and pruning of trees		.0	
5. Harvesting	Picking of fruits	45		45
	Total	63	<u>,ŏ </u> <u>ŏ</u>	.0 71

Year	Picking	Fruits	Other Ac	tivities.
	Family	Hired	Family	Hired
6	75.0	15.0	18.8	8.0
° 7	75.0	60.0	18.8	8.0
8	75.0	195.0	18,8	8.0
ŷ	75.0	330.0	18.8	8.0
10	75.0	510.0	18.8	8.0
11	75.0	690.0	18.8	8.0
12	75.0	690.0	18.8	8.0

Commodity : Marquisa	Farming Practice	1	Unit : ma	
Item	Farming Fractice	Family	Hired	Total
st year				
Land Finishing	Finishing of land after preparation	-•	32.0	32.0
2. Land cultivation	Plowing		32.0	32.0
<ol> <li>Holes preparation</li> </ol>	Digging of holes with a size of 0.3 x 0.3 x 0.3 m		15.0	15.0
I. Manuring	Putting of organic manure into holes	••	15.0	15.0
5. Planting	Planting of seedlings with a distance of 4 x 5 m	40.0		40.0
6. Fertilizing	Applying of basic fertilizers	39.2		39.3
7. Tree maintenance	Setting of support wire fence		20.0	20.(
	Total	79.2	114.0	193.2
2nd year				
1. Tree maintenance	Trimming and pruning of trees	16.0		
2. Harvesting	Picking of fruits	12.0		
3. Manuring	Putting organic manure to trees	14.4		14.4
4. Fertilizing	Applying of fertilizers (twice a year)	39.2		39.3
5. Pest control	Applying of agro-chemicals (when necessary)		32.0	32.0
6. Weed control	Weeding of land surface	32.0		32.0
7. Supplemental planting	Planting of supplemental seedlings with			
r. Dapprenterner Prenterig	manure and fertilizers		18.8	18.9
	Total	113.6	50.8	136.4
3rd year				
1. Tree maintenance	Trimming and pruning of trees	16.0		16.0
2. Harvesting	Picking of fruits	24.0		24.6
3. Manuring	Putting of organic manure to trees	18.0		18.0
4. Fertilizing	Applying of fertilizers (twice a year)	39.2	1	39.
5. Pest control	Applying of agro-chemicals (when necessary)		32.0	32.
6. Weed control	Weeding of land surface	56.0		56.
	Total	153.2	32.0	185.
<u>4th year</u>			1	
1. Tree maintenance	Trimming and pruning of trees	16.0		16.
2. Harvesting	Picking of fruits	72.0		72.
3. Replanting	Replanting of fruit trees (0.2 Ha)	42.0		42.
4. Manuring	Putting of organic manure to trees	18.0	10	18.
5. Fertilizing	Applying of fertilizers (twice a year)	39.2	2	39.
6. Pest control	Applying of agro-chemicals (when necessary)		32.0	32.
7. Weed control	Weeding of land surface	56.0	)	56.
	Total	243.2	2 32.0	275.
5th year			1	
1. Tree maintenance	Trimming and pruning of trees	16.0	) (	16.
2. Harvesting	Picking of fruits	144.0	) (	144
3. Replanting	Replanting of fruit trees (0.25 Ha)	42.0	) (	42
4. Manuring	Putting of organic manure to trees	18.0	) (	18
5. Fertilizing	Applying of fertilizers (twice a year)	39.1		39
6. Pest control	Applying of agro-chemicals (when necessary)		32.0	
7. Weed control	Weeding of land surface	56.0	1	56
	Total	315.3		1

### Table B.4.14 Annual Labor Requirement by Farming Practice (7/9)

Year	Picking	Fruits	Other Ac	tivities.
	Family	Hired	Family	Hired
6	150.0	30.0	259.2	32.0
7	150.0	30.0	259.2	32.0
8	150.0	30.0	259.2	32.0
9	150.0	30.0	259.2	32.0
10	150.0	30.0	259.2	32.0
11	150.0	30.0	259.2	32.0
12	150.0	30.0	259.2	32.0

Item	Farming Practice			
		Family	Hired	Total
lst year				
Land Finishing	Finishing of land after preparation		8.0	8,
2. Land cultivation	Plowing		8.0	8.
<ol> <li>Holes preparation</li> </ol>	Digging of holes with a size of 1.0 x 1.0 x 1.0 m		20.0	
4. Manuring	Putting of organic manure into holes		20.0	
5. Planting	Planting of seedlings with a distance of 10 x 10 m			8.
6. Fertilizing	Applying of basic fertilizers	2.2		2.
-	Total	10.2	56.0	66.
2nd year				
1. Fertilizing	Applying of fertilizers and soil conditioner	1.9		1.
2. Pest control	Applying of agro-chemicals (when necessary)		8.0	8
3. Weed control	Weeding of land surface	4.0		4
4. Water supply	Watering to fruit trees	40.0	1	40
5. Supplemental planting	Planting of supplemental seedlings with		10.1	10
	manure and fertilizers			0
	Total	45.9	18.1	64
<u>3rd year</u>			ļ	
1. Fertilizing	Applying of fertilizers	4.1		4
2. Pest control	Applying of agro-chemicals (when necessary)		8.0	
3. Weed control	Weeding of land surface	10.0		10
4. Water supply	Watering to fruit trees	20.0		20
	Total	34.1	8.0	42
<u>4th year</u>				1
1. Fertilizing	Applying of fertilizers	4.4		4
2. Pest control	Applying of agro-chemicals (when necessary)		8.0	1
3. Weed control	Weeding of land surface	10.0		10
	Total	14.4	I 8.0	22
Sth year				
1. Fertilizing	Applying of fertilizers	2.2		2
2. Pest control	Applying of agro-chemicals (when necessary)		8.0	
3. Weed control	Weeding of land surface	4.0	) (	4
4. Harvesting	Picking of fruits	8.0		
Ť	Total	14.3	2 8.0	2

# Table B-4-14 Annual Labor Requirement by Farming Practice (8/9)

Year	Picking	Fruits	Other Ac	tivities.
	Family	Hired	Family	Hired
6	20.0	0.0	6.2	8.0
7	44.0	0.0	6.2	8.0
8	75.0	5.0	6.2	8.0
9	75.0	45.0	6.2	8.0
10	75.0	85.0	6.2	8.0
11	75.0	125.0	6.2	8.0
12	75.0	125.0	6.2	8.0

Table B.4.14	Annual Labor	Requirement by	Farming	Practice (9/9)
--------------	--------------	----------------	---------	----------------

Item	Farming Practice			
nem		Family	Hired	Total
st year				
. Land Finishing	Finishing of land after preparation		40.0	40.0
Land cultivation	Plowing		40.0	40.0
. Holes preparation	Digging of holes with a size of 0.6 x 0.6 x 0.6 m		60.0	60.0
Manuring	Putting of organic manure into holes		50.0	
. Planting	Planting of seedlings with a distance of 2 x 2.5 m	12.0		12.0
5. Fertilizing	Applying of basic fertilizers	40.0		40,0
Ŭ	Total	52.0	190,0	242.0
2nd year				
I. Fertilizing	Applying of fertilizers (twice a year)	15.0		15.0
2. Pest control	Applying of agro-chemicals (when necessary)	1	80.0	
3. Weed control	Weeding of land surface	40.0		40.0
4. Water supply	Watering to fruit trees	88.0	1	
5. Supplemental planting	Planting of supplemental seedlings with		33.0	
	manure and fertilizers			0,0
	Total	143.0	125.0	268.
3rd year				
1. Fertilizing	Applying of fertilizers (twice a year)	18.0	1	18.
2. Pest control	Applying of agro-chemicals (when necessary)		40.0	
3. Weed control	Weeding of land surface	40.0	ļ.	40.
4. Water supply	Watering to fruit trees	50.0		50.
5. Tree maintenance	Pruning and thinning out of trees	50.0		50.
	Total	158.0	40.0	198.
4th year			1	
1. Fertilizing	Applying of fertilizers (twice a year)	18.0		18.
2. Pest control	Applying of agro-chemicals (when necessary)		40.0	40
3. Weed control	Weeding of land surface	40.0		40
4. Water supply	Watering to fruit trees	50.0	1	50
5. Tree maintenance	Pruning and thinning out of trees	50.0		50
6. Harvesting	Picking of fruits (twice a year)	80.0	1	80
č	Total	238.0	) 40.0	)  278

Year	Picking	Fruits	Other Ac	tivitics.
	Family	Hired	Family	Hired
6	100.0	0.0	158.0	40.0
7	150.0	30.0	158.0	40.0
8	150.0	130.0	158.0	40.0
9	150.0	250.0	158.0	40.0
10	150.0	250.0	158.0	40.0
11	150.0	250.0	158.0	40.0
12	150.0	250.0	158.0	40.0

1/5)
е
ctai
Hee
er
d si
ent
en E
luir
Rec
nput Requirements per Hectare (1/5)
d Farm Input
arm
Far
nual
15 Annual
Ξ¥.
- Î
B-4-1
- e
Tab
-

----

Crops / Inputs	wut	Ist	2nd	3rd	t <del>å</del>	<del>\$</del>	4ĵ	ș	5×	2			
Avocado													
<ul> <li>Seedling</li> </ul>		000	0.00				•••	ŀ	•	Ŀ		•	•
<ul> <li>Purchased seed</li> </ul>	OC	100.0	N.N.	•									
<ul> <li>Fernilizer</li> </ul>				0	5	102.01	0 000	0 990	286.0	306.0	326.0	346.0	350.0
- Urea	kg	20.0	0.85	J.X.O	48.0	1 20.0		2 2 2 2 2	2000	0002	320.0	320.0	320.0
. 1'SP	ķŝ	50.0	62.0	0.67	96.5	0,44	199.0	0.462	0.202	0.040	10000	400.0	200.0
. KCI	ξ,	20.0	24.0	31.0	38.5	112.0	202.0	292.0	0.785	10.004			5
* Auro-chemicals									2 4	0.00	20.00	20.01	20.0
- Pestivide	lit.	1.0	1.0	20.0	20.0	20.01	20.0	0.07	2.2	2.04	2 ' 3		•
- Fungicide	kg	,	•	•	1	•	•	1		•			
<ul> <li>Other materials</li> </ul>												·	•
- Organic manure	ton	4.0	0.8	1	•	•	•	• •	• •	' (		6	č
- Orvanic materials	ų	•	1.6	2.0	5.0	2.0	10.0	0	07	0.7	2		
- Plastic cover	no.		•	•	•	1	•	•		•			
* T alsor													0.00
Lauros - Francius	p/m	10.6	52.1	33.8	37.2	75.0	95.0	95.0	95.0	95.0	95.0	0.66	0.02
	÷.	48.0	24.6	8.0	8.0	8.0	0.0	118.0	228.0	338.0	448.0	5 X N	0.810
1000117	2												
Bananu													
<ul> <li>Seedling</li> </ul>										;	1000 0		-
Purchased seed	°.	1000.0	•	1	•	1000.0	•						
* Fortilizor									0.965	200.0	175.0	325.0	300.01
- Urea	kg	50.0	250.0		375.0	325.0	0.005	0.070	2.040 2.040	_	0.521	125.0	
- TSP	kg	50.0	100.0		125.0	0.611	100.01		0002		275.0	300.0	
- KCI	kg	50.0	150.0	250.0	300.0	300.0	0.002	D.67.3	N.N.N.C				
"Agro-chemicals						-	-	1 1.			1.0	1.0	1.0
- Pesticide	ä	1.0	1.0		0.1	0.1	5 <				10	1.0	
- Fungicide	kg	0.1	1.0	0.1	1.0	0.1	. <b>^ .</b> 1						
<ul> <li>Other materials</li> </ul>								000			20.0	20.0	
- Organic manure	ton	40.0	•		20.0	20.0				0.05	150	15.0	20.0
- Organic materials	ä	•	20.0		15.0	0.41	70.02	0.01			00000		1
- Plastic cover	no.	•	1000.0	2000.0	2000.0	2000.0	•	1000.0	0.0002	0.0002	A.00.4		
* Labor								9 10 F		485.0	2000	365.5	2,165
- Family	p/w	196.0	391.5	ч	560.0	n	-1	C.140	r				
C. mark	ber L	380.0		40.0	40.0	40.0	20.0%	20.02	0.0 4 6				

Source : JICA Study Team

1000         230         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         - <th>• Konting During During During Compound         • Konting During Compound         • Konting During K         • Konting During         • Konting During         • Konting During         • Konting During         • Konting During         • Konting         · Konting         · Konting         · Konting         · Konting         · Konting         <t< th=""><th>Crops / Inputs</th><th>m</th><th>1.51</th><th>2nd</th><th>3rd</th><th>4</th><th>241</th><th>6th</th><th>7th</th><th>8th</th><th>9th</th><th>10th</th><th>13ch</th><th>134</th></t<></th>	• Konting During During During Compound         • Konting During Compound         • Konting During K         • Konting During         • Konting During         • Konting During         • Konting During         • Konting During         • Konting         · Konting         · Konting         · Konting         · Konting         · Konting <t< th=""><th>Crops / Inputs</th><th>m</th><th>1.51</th><th>2nd</th><th>3rd</th><th>4</th><th>241</th><th>6th</th><th>7th</th><th>8th</th><th>9th</th><th>10th</th><th>13ch</th><th>134</th></t<>	Crops / Inputs	m	1.51	2nd	3rd	4	241	6th	7th	8th	9th	10th	13ch	134
Souting Perture         Resting Perture         Resting Perture         Resting Pe	no.         1000         200         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000	Duku													
Fredition:         Fredition:         Redition:         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000	Kg         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         20	<ul> <li>Soudling</li> <li>Purchased seed</li> </ul>		100.0	20.0	•		•	4	•	•	4	•	•	
Compand         kg         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000         2000 <t< td=""><td>NE         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         20</td><td>• Fortilizar</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>4 4</td><td>0 0 0</td><td>0000</td><td>VIVE</td><td>0000</td><td>0 002</td></t<>	NE         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         200.0         20	• Fortilizar								4 4	0 0 0	0000	VIVE	0000	0 002
TSP         kg         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         10	KS         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1	- Compound	kg	200.0	200.0	200.0	200.0	200.0	200.0	200.0	0.002	0-007	0.002	· · ·	
. KC1         kg         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000	kg         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         100.0         1	-TSP	kg	•	•	•	1	•				- 101	0.001	10.001	100.001
Agree-homicals         In         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10	In       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.	- KCI	Kg Kg	100.0	100.0	100.0	100.0	100.01	100.0	0.001	0.001	0.001	2.001		
• Perside         in         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	*Agro-chemicals						•	•		-	- V -		101	1.01
- Fungoide         ks         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         - <th< td=""><td>ks       in       200       0.4       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i<!--</td--><td>- Pesticide</td><td>1ji</td><td>1.0</td><td>1.0</td><td>1.0</td><td>0.1</td><td>1.0</td><td>0.</td><td>0.1</td><td>-&gt;- </td><td>7.1</td><td></td><td></td><td>,</td></td></th<>	ks       in       200       0.4       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i       i </td <td>- Pesticide</td> <td>1ji</td> <td>1.0</td> <td>1.0</td> <td>1.0</td> <td>0.1</td> <td>1.0</td> <td>0.</td> <td>0.1</td> <td>-&gt;- </td> <td>7.1</td> <td></td> <td></td> <td>,</td>	- Pesticide	1ji	1.0	1.0	1.0	0.1	1.0	0.	0.1	->- 	7.1			,
Cher materials         Concernation         ten         200         0.4         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         - <t< td=""><td>Ken         200         0.4         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10</td><td>- Fungicide</td><td>kg</td><td>•</td><td>•</td><td>•</td><td></td><td>1</td><td>•</td><td>•</td><td>•</td><td>•</td><td>· · · ·</td><td></td><td></td></t<>	Ken         200         0.4         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10	- Fungicide	kg	•	•	•		1	•	•	•	•	· · · ·		
- Organic mature         ton         200         0.4         -         -         -         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10	Let         Tool $0.4$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$ $1.0$	• Other materials													
• Organic materials         [11         · 0.8         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0 <th1.0< th="">         1.0         1.0</th1.0<>	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	- Organic manure	ton	20.0	10.4		,	•	•	•		•	* <		
- Plastic sover         no         -         -         -         -         -         -         -         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Organic materials	E.	•	0.8	1.0	1.0	1.0	1.0	1.0	0.1	2	5 		
Labor         Family         may         12.8         32.2         36.4         27.0         45.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         <	m/d         12.8         32.2         36.4         27.0         48.8         73.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8	- Plastic cover	DO	•	•	•	•	1	1	•	•	1			
- Family         rold         12.8         32.2         36.4         27.0         43.8         73.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.8         93.9         93.9         93.9	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Labor								į			2	A 20	× 20
· Hired         md         43.0         20.8         K.0         K.0         K.0         Z.3         113.0         Z03.0         JA1.0         Wardward           Purchased seed         no.         100.0         20.0         2         1         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         - <td><math display="block"> \begin{array}{c ccccccccccccccccccccccccccccccccccc</math></td> <td>- Family</td> <td>p/uz</td> <td>12.8</td> <td>32.2</td> <td>36.4</td> <td>27.0</td> <td>48.8</td> <td>78.8</td> <td>93.X</td> <td>X 66</td> <td>5.5.8</td> <td>3.65</td> <td></td> <td>0.00</td>	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	- Family	p/uz	12.8	32.2	36.4	27.0	48.8	78.8	93.X	X 66	5.5.8	3.65		0.00
Seeding - Purchased seed         no.         100.0         20.0         20.0         1.2.0         18.4         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	- Hired	pu	48.0	20.8	x.0	8.0	8.0	х. О	23.0	113.0	203.01	0.53.6	1440.01	) ;
Seeding - Purchased seed         no.         100.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         2	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$														
chased seed         no.         1000         200         200         10.         1000         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	h Durian													
J seed         no.         100.0         20.0         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -	ro.         100.0         20.0         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         - <th< td=""><td>* Seedling</td><td>_</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>,</td><td></td></th<>	* Seedling	_											,	
kg       1.6       5.1       10.8       12.0       18.4       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0 <th< td=""><td>kg       1.6       5.1       10.8       12.0       18.4       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       <t< td=""><td>-Purchased seed</td><td>цо.</td><td>0.001</td><td>20.0</td><td>•</td><td>•</td><td>•</td><td>•</td><td>,</td><td>1</td><td>•</td><td>•</td><td></td><td></td></t<></td></th<>	kg       1.6       5.1       10.8       12.0       18.4       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0       20.0 <t< td=""><td>-Purchased seed</td><td>цо.</td><td>0.001</td><td>20.0</td><td>•</td><td>•</td><td>•</td><td>•</td><td>,</td><td>1</td><td>•</td><td>•</td><td></td><td></td></t<>	-Purchased seed	цо.	0.001	20.0	•	•	•	•	,	1	•	•		
kg         1.6         5.1         10.8         12.0         18.4         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.	kg         16         \$11         10.8         12.0         18.4         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.	• Fertilizer	-												20.05
kg         3.2         10.2         21.6         24.0         36.8         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         4	isg       3.2       10.2       21.6       24.0 $36.8$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $40.0$ $4$	- Urca	, K	1.6	5.1	10.X	12.0	18.4	20.0	20.02	20.02				40.04
kg         3.2         10.2         21.6         24.0         36.8         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         40.0         4	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	- TSP	, kg	3.2	10.2	21.6	24.0	36.8	40,0	40.0	40.0				0.07
e kg 1.0 1.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0 2	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	- KCI	kg	3.2	10.2	21.6	24.0	36.8	40.0	40.0	40.0				2
e       kg       1.0       1.0       1.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0       2.0	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	*Agro-chemicals						6	6		Ċ		с г	0	2.0
e         kg         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	- Pesticide	4	1.0	1.0	60	2.0	2.0	2.0				4	•	
manure         too         4.0         0.8         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         - </td <td><math display="block"> \begin{array}{c ccccccccccccccccccccccccccccccccccc</math></td> <td>- Fungicide</td> <td>kg  </td> <td>• </td> <td>•</td> <td>1</td> <td>•</td> <td>•</td> <td>•</td> <td>•</td> <td>•</td> <td>•</td> <td>•</td> <td></td> <td></td>	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	- Fungicide	kg	• 	•	1	•	•	•	•	•	•	•		
Organic manure     ton     4.0     0.8     .     .     2.0     2.0     2.0     2.0       Organic materials     lit     .     .     .     .     .     2.0     2.0     2.0       Organic materials     lit     .     .     .     .     .     2.0     2.0     2.0     2.0       Plastic cover     no.     .     .     .     .     .     .     .     .       Family     m/d     10.6     52.1     33.8     37.2     75.0     95.0     95.0     95.0       Family     md     48.0     24.6     8.0     8.0     80.0     28.0     95.0     373.0     373.0	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	* Other materials													
Organic materials     lit     -     -     -     2.0     2.0     2.0     2.0       Plastic covort     no.     -     -     -     -     -     -     -       Plastic covort     no.     -     -     -     -     -     -     -       Family     m/d     10.6     52.1     33.8     37.2     75.0     95.0     95.0     95.0     95.0       Family     md     48.0     24.6     8.0     8.0     80.0     28.0     95.0     373.0     373.0     373.0	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	- Organic manure	ton	4.0	0.81	•	•	1	• •	•	• •		, ,		0.5
Plastic cover         no.         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	- Organic materials	Ħ	•	•	•	•	•	2.0	7.0	0		4	1	~~.
Family m/d 10.6 52.1 33.8 37.2 75.0 95.0 95.0 95.0 95.0 95.0 95.0 373.0 373.0 3 . Hired md 48.0 24.6 8.0 8.0 8.0 28.0 98.0 155.0 233.0 373.0 3	m/d 10.6 52.1 33.8 37.2 75.0 95.0 95.0 95.0 95.0 95.0 95.0 95.0 373.0 3 md 48.0 24.6 8.0 8.0 8.0 28.0 98.0 153.0 233.0 373.0 373.0 3	- Plantic cover	о́г	•	•	•	•	•	•	•	•	•	'		
md 48.0 24.6 8.0 8.0 28.0 98.0 153.0 233.0 373.0 3 md 48.0 24.6 8.0 8.0 28.0 98.0 153.0 233.0 373.0 3	m/d 10.6 52.1 33.8 37.2 7.50 750 750 750 750 750 373.0 3 md 48.0 24.6 8.0 8.0 80.0 28.0 98.0 153.0 233.0 373.0 3	* Labor						Î	0	0 20	( ) ( ) ( ) ( )		950	95.0	95.0
md 48.0 24.6 8.0 8.0 80.0 26.0 mm	md 48.0 24.6 8.0 8.0 8.0 80.0 20.0	- Family	p/m	10.6	52.1	33.8	37.2	0.67	0.04	0.0%	0.5%		0.645	373.0	373.0
	Samaa . 110 A Study Team	- Hired	e e	48.0	24.6	8.0	8.0	x0.0	0.82	78.U	0.661				

Table B-4-15 Annual Farm Input Requirements per Hectare (2/5)

B - 59

Crops / Inputs	wit	lst	2nd	5rd	414	5	The second		Į				
ožunW													
* Seedling			000			,	•	•	,	•••	•	,	,
Purchased seed	è	2.202	2.2.2			~							
refuizer	1	0.00	070	29.0	38.0	56.0	81.6	N7.0	\$7.0	x7.0	87.0	07.2	×7.0
- Urea	2.	0.04		0 7 1	0.1	27.0	40.8	43.5	43.5	43.5	43.5	43.5	43.5
· TSP	Ϋ́ε	<u>n.c</u>	2.4	r e	0.00		0.00	0 21 1	116.0	136.0	116.0	116.0	1:6.6
· KCI	kg	20.0	24.0	29.0	30.0	/0.0/	100.0	201					
• Agro-chemicals								с г	c	c r	10	2.0	o ri
- Pesticide	ä	0'1	0.1	9.0	5.0	0.1	o N		2	, i	, , , i		
- Fungicide	ks S	•	•	•	•	•	· · ·	,		;			
<ul> <li>Other materials</li> </ul>									<b>_</b>			•	
Organic manure	ton	20.0	0.4	•	•	•	•						~
- Organic materials	114	•	64	6.1	2.4	E.E	4,7	5.0	0.0	<u>n.</u>	2.7		
- Plastic cover	00	•		•	•	•	<del>.</del>	•	•	•	•		
• Labor												2	
- Family	p/w	12.8	32.2	36.4	27.0	48.8	93.8	93.8	9.5.K	8.59	A.UV	10.0X	10.02
- Hirod	pui	48.0	20.8	x.0	×.0	8.0	23.0	83.0	158.0	233.0	0.672	0.000	
			~										
Mangosteen													
<ul> <li>Seedling</li> </ul>											•	1	
-Purchased seed	no.	100.0	20.0	•	•	•	•	•	•				
* Fertilizer						4			0.00			20.0	70.0
- Urea	kg	36.0	26.4	24.0	36.8	56.0	68.0	/0.0/		200	20.02	20.05	
-TSP	к К	16.0	12.8	26.4	30.0	46.0	20.02		0.00			0.02	2005
- KCI	kg	28.0	29.6	30.0	34.0	47.0	50.0		0.00				
*Agro-chemicals									-		-	1 0	0
- Pesticide	ية ا	1.0	1.0	1.0	0,1	0.1	0.1	2	>				
- Fungicide	kg	•	•	•	•	1		,	,	•			
* Other materials													
Organic manure	ton	6.0	27	•	• •	• (	• <		, c		2.0	2.0	2.0
- Organic materials	lit	•	1.6	5.6	2.0	0.1	) 	2	•				
- Plastic cover	10.	·	•	•	•	•	,	•	•				
* Labor					1	5	a Ç		03 X	X 10	03.XI	93.X	93.8
- Family	p/m	12.8	32.2	36.4	27.0	5.50	0.02	0.02	0 800	~		0	9
. Hired	Ĕ	48.0	20.8	0.×	8.0	0.×	N.C.7						

Š.
<u> </u>
Hectare
; per
nents
f R
Inpu
Farm Inp
<b>IS Annual Farm Input Requiren</b>
-15
8-4
Table B-4-1

B - 60

Marquisa • Seedling • Fertilizor • ZA + DS + ZK • TSP • KC! • Ago-chemicals • Pexticide				5	;	ţ		Ş					
eedli ertili			+										
<ul> <li>Fertilizer</li> <li>ZA + DS + ZK</li> <li>ZSP</li> <li>TSP</li> <li>KCI</li> <li>Agro-chemicals</li> <li>Pesticide</li> </ul>	no.	\$00.0	100.0	;-	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	0.001
- ZA + DS + ZK - TSP - KCI • Agro-chemicals - Pexticide		0.000	0.00%	0 00%	X00.0	0.00%	x00.0	K00.0	×00.0	800.0	x00.0	x00.0	0.00%
- TSP - KCI • Ago-chemicals - Pesticide	Я.	×00.0	0.000			•	•	•		,	1		•
- KC1 • Agro-chemicals - Pexticide	×s.	,	•	<u> </u>		•••	•		•			•	
* Argo-chemicals - Pesticide	кg	•	•	,	•								
- Pesticide					0.50	C 9 C	0.5	25.0	25.0	25.0	25.0	25.0	25.0
	ii	12.5	25.0	0.67	0.64	2.02	0.02	80.0	50.0	50.0	50.0	50.0	50.0
- Fungicide	, Kg	25.0	50.0	50.01	0.00	0.00							
<ul> <li>Other materials</li> </ul>						4	6	ſ	0	2.0	2.0	0	2.0
- Orcanic manure	ton	10.0	2.0		0	2.0			2 4 4		4 0	1	4.0
- Orvanic materials	II	1	4.0	5.0	4.0	0.4	0.4	0.4	i S	> r		•	
- Plastic cover	no.	•	٠	•	,	,	•	•	•				
- Labor						1					321.2	321.2	321.2
- Family	m/d	79.2	113.6	153.2	243.2	315.2	5.125	1.130 7.77	4.140			62.0	62.0
- Hired	рш	114.0	50.8		32.0	32.0	0.7.0						
Rambutun													
<ul> <li>Seedling</li> </ul>									•	1	•	•	
-Purchased seed	OU	100.0	20.0	•	1	•	•						
<ul> <li>Ferultizer</li> </ul>								210	503		67.0	94.01	100.0
- Urea	kg	10.0	12.0	-	0.71	<u></u>				926	24.6	45.0	50.05
• TSP	- K3	5.0	7.0	9.5	12.0	0.4	0.01				49.0		50.0
- KCI	k g	15.0	17.0		22.0	24.5	29.0						
* Arm-chemicals										( (		с С	0
- Perticido	1 <u>1</u>	1.0	1.0	6.4	0	0.4	2.0	0.7					
- Funcicide	, K	•	•	•	•	•	•			•			
* Other materials													
- Orvanic manure	ton	2.0	0.4	1	•	•						, ,	¢
· Oreanic materials	ų	•	27	1.9	2.4	2.5	5.7	2.5	C77	<u>,</u>	<b>-</b>		
- Plastic cover	ю.	•	•	•	•	•			• •				
* Labor											81.2 	215 X15	21%
- Family	p/m	10.2	45.9			4 0 7 :	* 5 *	+ < 5 0					
- Hired	E	\$6.0	18.1	0.8	0.8 								

Table B-4-15 Annual Farm Input Requirements per Hectare (4/5)

B - 61

Source : JICA Study Team

MARK Antimised benchmad and Freeding         Condition (100)         Condition (100) <thcolinis (100)<="" th="">         Condition (100)</thcolinis>	<ul> <li>Seeding</li> <li>Fertilizer</li> <li>Fertilizer</li> <li>Urea</li> <li>Urea</li> <li>Vea</li> <li>Kg</li> /ul>			╞			-		t				
• Securing Prenchases         no         2000         400         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·         ·<	d seed Fr K K K												
		2000.0	400.0	<del>,</del>				•	•		•	•	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$								0.027	0.001	100.01	100.0	100.001	100.0
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		50.0	50.0	50.0	90.0	100.0	0.001		200X	20 0X	X0.0	X0.0	×0.0
$\cdot KG$ $kg$ $600$ $600$ $600$ $600$ $1200$ $1200$ $1200$ $1200$ $1200$ $1200$ $1200$ $1200$ $1200$ $1200$ $1200$ $1200$ $1200$ $1200$ $1200$ $1200$ $1200$ $1200$ $1200$ $1200$ $1200$ $1200$ $1200$ $1200$ $1200$ $1200$ $1200$ $1200$ $1200$ $1200$ $1200$ $1200$ $1200$ $1200$ $1200$ $1200$ $1200$ $1200$ $1200$ $1200$ $1200$ $1200$ $1200$ $1200$ $1200$ $1200$ $1200$ $1200$ $1200$ $1200$ $1200$ $1200$ $1200$ $1200$ $1200$ $1200$ $1200$ $1200$ $1000$ $100$ $100$ $100$ $100$ $100$ $100$ $100$ $100$ $100$ $100$ $100$ $100$ $100$ $100$ $100$ $100$ $100$ $100$ $100$ $100$ $100$ <td></td> <td>40.0</td> <td>40.0</td> <td>40.0</td> <td>72.0</td> <td>x0.0</td> <td>x0.0</td> <td>0.00</td> <td>0.001</td> <td>0.001</td> <td>0.001</td> <td>120.0</td> <td>120.0</td>		40.0	40.0	40.0	72.0	x0.0	x0.0	0.00	0.001	0.001	0.001	120.0	120.0
-Agree-domicals     in     1.0     2.0     4.0     4.0     4.0     4.0     4.0       - Posticide     - Environmentals     ks     -     -     -     -     -     -       - Organis matrixis     10     200     4.0     10.0     10.0     10.0     10.0       - Organis matrixis     10     20.0     4.0     2.0     4.0     -       - Organis matrixis     10     10.0     10.0     10.0     10.0       - Organis matrixis     10     10.0     10.0     10.0     10.0       - Organis matrixis     10     10.0     10.0     10.0     10.0       - Organis matrixis     10     12.0     2.3x0     2.3x0     3.0x0     3.0x0       - Index     190.0     12.3.0     40.0     40.0     200.0     200.0     200.0       - Flaxity     - Hiced      -     -     -     -     -       - Flaxity     - Hiced      -     -     -     -     -       - Flaxity     - Hiced     -     -     -     -     -     -       - Flaxity      -     -     -     -     -     -       - Flaxity     -		60.0	60.09	60.0	108.0	120.0	120.0	0.021	0.021	2	-		
$\begin{array}{cccccccccccccccccccccccccccccccccccc$									4	0.6	4 U	4 D	4
Fungicide     Kg     ·     ·     ·     ·       • Other materials     ton     200     4.0     ·     ·     ·       • Other materials     ton     200     4.0     ·     ·     ·       • Other materials     ton     200     4.0     ·     ·     ·       • Other materials     tin     200     4.0     ·     ·     ·       • Other materials     tin     200     4.0     ·     ·     ·       • Other materials     tin     200     4.0     ·     ·     ·       • Other materials     tin     2.0     19.0     10.0     10.0     10.0       • Description     180.0     185.0     185.0     258.0     308.0     308.0     308.0       • Luber     •     •     •     •     •     •     ·     ·       • Fanity     md     190.0     125.0     40.0     40.0     70.0     70.0     70.0       • Hited     •     •     •     •     •     •     ·     ·     ·       • Table     •     •     •     •     •     •     ·     ·     ·       •     •     •     •     <		1.0	2.0	4,0	4	4.0	4.0	2	) t	2 T	i i	,	
• Other materials       Ion       200       40       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       - <td></td> <td><del>.</del></td> <td>•</td> <td>•</td> <td>•</td> <td></td> <td>•</td> <td>1</td> <td>•</td> <td>•</td> <td></td> <td></td> <td></td>		<del>.</del>	•	•	•		•	1	•	•			
- Organic manute     100     200     4.0     -     -     -     -     10.0     10.0       - Organic maturials     11     -     x0     10.0     10.0     10.0     10.0       - Organic maturials     -     -     -     -     -     -     -     10.0       - Organic maturials     -     -     -     -     -     -     -     -     10.0       - Platic cover     -     -     -     -     -     -     -     -     -     -     -       - Indic     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     - <td>Other materials</td> <td></td>	Other materials												
- Organic materials     It     - kk0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0     10.0 <td< td=""><td>manure</td><td>20.0</td><td>4.0</td><td></td><td>•</td><td>•</td><td>•</td><td>•</td><td>•</td><td></td><td>•</td><td>1 2</td><td></td></td<>	manure	20.0	4.0		•	•	•	•	•		•	1 2	
- Platto cover no		Ł	X.0	10.0	10,0	10.0	10.0	10.0	10.0	10.01	0.01	0.01	ò,
"Lubor - Franity mod 32,0 143,0 158,0 238,0 308,0 308,0 308,0 308,0 308,0 308,0 308,0 308,0 308,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290,0 290		,	1			+		•	•	•			
- Family mod 52.0 143.0 138.0 238.0 238.0 2000 2000 2000 2000 2000 2000 2000 2	* Labor										0 602	10 202	308
Michael Prove 200 200 200 200 200 200 200 200 200 20	Family	52.0	143.0	158.0	23K.0	25X.0	30%.0	30X.0	0.505		0.000	0.000	0.000
		190.0	125.0	40.0	40.0	40.0	70.0	170.0	0.067				
									-				
											_		
		n											
		-											
							i				/ . <b>F</b> .		
				•									_
			<u> </u>										
			<u> </u>	••••••									

Table B-4-15 Annual Farm Input Requirements per Hectare (5/5)

B - 62

Avocado     Banana     Duku     Durian       1     0.00     0.0     0.0     0.0       2     0.00     10.0     0.0     0.00       3     0.00     20.0     0.0     0.0       4     0.00     20.0     0.0     0.0       5     0.75     20.0     0.5     1.0       6     1.50     20.0     1.5     3.0       7     2.50     20.0     1.5     3.0       9     5.50     20.0     4.5     6.0	Fruit Commodity	dity				Inte	Intercrop
0.00 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Durian Mango	Mangosteen	Marquisa	Rambutan	Salak	Maize	Groundnut
0.00 10.0 0.0 0.00 20.0 0.0 0.75 20.0 0.0 1.50 20.0 0.0 1.5 20.0 1.0 2.50 20.0 1.5 2.50 20.0 1.5 4.6 2.0 2.0 0.5 5.5 20.0 2.0 0.5 1.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 2.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0		0.0	0.0	0.0	0.0	2.4	1.2
0.00 20.0 0.0 0.75 20.0 0.0 1.50 20.0 0.5 1.50 20.0 1.0 2.50 20.0 1.5 5.50 20.0 1.5 4.60 20.0 1.5		0.0	1.2	0.0	0.0	2,4	1.2
0.75 20.0 0.0 1.50 20.0 0.5 1.50 20.0 1.0 2.50 20.0 1.5 4.00 20.0 3.0 4.5		0.0	2.4	0.0	0.0	4.	1.2
0.75 20.0 0.5 1.50 20.0 1.0 2.50 20.0 1.5 4.00 20.0 3.0 5.50 20.0 4.5		0.0	3.6	0.0	1.0	2.4 4	7.1
1.50       20.0       1.0         2.50       20.0       1.5         4.00       20.0       3.0         5.50       20.0       3.0         5.50       20.0       3.0		0.5	7.2	4.0	2.5	4.4	1.2
2.50 20.0 1.5 4.00 20.0 3.0 5.50 20.0 4.5		1.0	9.0	1.0	4.S	4.	
5.50 20.0 3.0 4.5 20.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0 2.		1.5	0.6	2.2	7.0	2.4	1.2
5.50 20.0 4.5 20.0 2.5 20.0 4.5		3.0	0.6	4.0	10.0	4.7	
	6.0 9.0	4.5	9.0	6.0	10.0	4.4	1.2
		6.5	0.6	8.0	10.0	4 Ci	1.2
8.00 20.0 8.5		8.5	9.0	10.0	10.0	5.4 7	
8.00 20.0 8.5		8.5	<u>9.0</u>	10.0	10.0	2.4	

Table B-4-16 Annual Target Yield

B - 63

District	Planted Area (ha)	Fruit Commodity	Prospected Production (ton)	Prospected Market Supply (ton)
1. Dairi	300	Durian	2,400	1,920
2. Tapanuli Tengah	750	Durian	6,000	4,800
3. Tapanuli Utara	500	Durian	4,000	3,200
4. Tapanuli Selatan	800	Mangosteen	6,800	5,440
5. Tapanuli Utara	500	Mangosteen	4,250	3,400
6. Karo	1,000	Marquisa	9,000	7,200
7. Langkat	500	Rambutan	5,000	4,000
8. Tapanuli Selatan	1,500	Salak	15,000	12,000
9. Bandung	500	Avocado	4,000	3,200
10. Ciamis	500	Duku	4,250	3,400
11. Bogor	500	Durian	4,000	3,200
12. Sumedang	1,000	Mango	13,500	10,800
13. Purwakarta	500	Mangosteen	4,250	3,400
14. Tasikmalaya	1,000	Salak	10,000	8,000
15. Lumajang	1,000	Avocado	8,000	6,400
16. Lumajang	500	Banana	10,000	8,000
17. Jombang	500	Banana	10,000	8,000
18. Jombang	1,150	Durian	9,200	7,390
19. Trenggalek	1,000	Durian	8,000	6,400
20. Tulungagung	1,000	Duku	8,500	6,800
21. Malang	1,700	Salak	17,000	13,600
22. Pasuruan	750	Mango	10,125	8,100
23. Gowa	500	Avocado	4,000	3,200
24. Soppeng	500	Avocado	4,000	3,200
25. Sidenreng Rappang	500	Mango	6,750	5,400
26. Majene	500	Mango	6,750	5,400
27. Bone	500	Mango	6,750	5,400
28. Maros	500	Mango	6,750	5,400
29. Wajo	500	Mango	6,750	5,400
30. Tana Toraja	500	Mangosteen	4,250	3,400
31. Polewali Mamasa	500	Mangosteen		3,400
32. Gowa	1,000	Marquisa	9,000	7,200
33. Tana Toraja	3,000	Marquisa	27,000	21,600
34. Mamuju	2,350	Rambutan	23,500	18,800
35. Enrekang	500	Rambutan	5,000	4,000
36. Pinrang	500	Rambutan	5,000	4,000
37. Barru	700	Rambutan	7,000	5,600

## Table B-4-17 Prospected Fruit Production and Market Supply

Province	Fruit						<u>M O</u>	NTH					
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	Durian												
	Marquisa												
	Mango												
North	Avocado									*****		******	
Sumatra	Lanzon												
	Mangosteen					4.4.7.2.1.C							
	Salak											·	
	Rambutan												<b> </b>
	Banana				XIIII								
	Durian												
	Mango											<i>\\\\\\</i>	<u> </u>
	Avocado												
West	Lanzon											•	<b>_</b>
Java	Mangosteen									ļ			
	Salak									L			
	Rambutan		illilli:						L	ļ			
	Banana		X/////	XIIII		1			<u> </u>	<u> </u>	ļ	¥/////	<u> XIIII</u>
	Durian							<u> </u>	ļ				
	Mango	<u> </u>		1					ļ	¥/////	¥//////	X/////	¥////
	Avocado								<u> </u>	ļ	<b></b>		<b>_</b>
East	Lanzon			<u>XIIII</u>	<u>XIIII</u>	§				<b> </b>	ļ	ļ	
Java	Mangosteen	10 a.d.								ļ	ļ		0 <b>]</b> 48
	Salak						<u> </u>	<u> </u>	<u> </u>	<b> </b>			<b>=</b>
	Rambutan								<b>_</b>		<u> </u>		
	Banana	<u>VIIII</u>	X////	XIIII	XIIII	4				<b>_</b>	<b>_</b>	<i>\/////</i>	<i>\$[[[[</i> ]
	Durian				8				ļ	ļ	<u> </u>	Ļ	-
	Marquisa		<b>1</b>	×	_				1	<u> </u>	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	, Annon	J
	Mango	XIIII	<u>a</u>	1					<u> </u>	<u> </u>	<i>\     </i>	<i>Ų/////</i>	
	Avocado			<b>  </b>			_	_	1	Ì	<b>_</b>		Ш
South	Lanzon			<u>KIIII</u>	<u> </u>	ne	.↓		<u> </u>	<b> </b>		<b>.</b>	
Sulawesi	Mangosteen			a Alexan		<u> </u>					<b>_</b>	<b> </b>	
	Salak				<b>.</b>		_	_			<u> </u>	<b>.</b>	
	Rambutan				Ŋ	,,	_ <b>_</b>			1	.	hom	
	Banana			X////	18////	Ø	1					V////	<u>X////</u>

Figure B-4-1 Peak Fruit Season in the Study Area

Source: JICA Study Team

### THE STUDY ON THE IMPROVEMENT IN QUALITY OF THE TROPICAL FRUITS

# Appendix C

# Post-harvest Handling and Processing

#### APPENDIX C POST-HARVEST HANDLING AND PROCESSING

### Table of Contents

			<u>Page</u>
١.	INTI	RODUCTION	C-1
2.	PRE	SENT CONDITION AND CONSTRAINTS OF POST-HARVEST	
	HAN	ADLING IN PROVINCES	C-1
	2.1	North Sumatra Province	C-1
	2.2	West Java Province	C-3
	2.3	East Java Province	C-4
	2.4	South Sulawesi Province.	C-6
3.	PRE	SENT CONDITION AND CONSTRAINTS TO FRUIT PRODUCTION	
	IN P	ROVINCES	C-8
	3.1	North Sumatra Province	C-8
	3.2	West Java Province	C-9
	3.3	East Java Province	C-9
	3.4	South Sulawesi Province	C-10
	3.5	Conclusion	C-10
4.	GEN	IERAL CONCEPT OF POST-HARVEST HANDLING	C-11
	4.1	Significance of Pre-harvest Handling	C-11
	4.2	Harvesting	C-11
	4.3	Sorting	C-12
	4.4	Grading	C-12
	4.5	Packaging	C-13
	4.6	Storage	C-14
	4.7	Transportation	C-15
5.	FRU	JIT PROCESSING	C-16
6.	BAS	SIC DEVELOPMENT PLAN	C-18
	6.1	North Sumatra Province	C-18
	6.2	West Java Province	C-19
	6.3	East Java Province	C-20
	6.4	South Sulawesi Province.	C-21

### List of Tables

(Tables in Tex	t)	0.1
Table C2.1	Tropical Fruit Production in North Sumatra	C-1
Table C2.2	Difference Between Urban Market Price and Farm Gate Price	C-2
Table C2.3	Tropical Fruit Production in West Java	C-3
Table C2.4	Comparison of Farm Gate Price of Mango by Variety and by Grade	C-4
Table C2.5	Tropical Fruit Production in East Java	C-4
Table C2.6	Size and Market of Mango Plantation Companies	C-6
Table C2.7	Tropical Fruit Production in South Sulawesi	C-6
Table C2.8	Mango Production in Potential Districts and Present Markets	C-7
Table C2.9	Volume of Shipments from Mamuju to Balikpapan	C-7
Table C3.1	Processed Fruit by Processing Method	C-10
Table C4.1	Shelf Life at Optimum Temperature	C-15
Table C5.1	Nutrient Composition of Tropical Fruit	C-17
Table C5.2	Balance of Processed Fruit Export and Import (1995)	C-18
Table C6.1	Proposed Facilities in North Sumatra	C-19
Table C6.2	Proposed Facilities in West Java	C-20
Table C6.3	Proposed Facilities in East Java	C-21
Table C6.4	Proposed Facilities in South Sulawesi	C-22
(Tables in An	nex)	<b>a</b> 00
Table C-1-1	List of Agri-business in North Sumatra	C-23
Table C-1-2	List of Agri-business in West Java	C-24
Table C-1-3	List of Agri-Business in East Java	C-25
Table C-1-4	List of Agri-business in South Sulawesi	C-26

#### APPENDIX C POST-HARVEST HANDLING AND PROCESSING

#### **1. INTRODUCTION**

It is a fact that post-harvest losses of agricultural products in developing countries usually amount to more than 25% of the total production, as a result of mishandling, spoilage, and pest infestation. This means that a quarter of the produce never reaches consumers. This is a huge waste of money and efforts of farmers and growers.

Fruit is perishable more quickly than grain and tuber if proper care is not taken for its handling, including harvesting, sorting, grading, packaging, and transportation to the market.

It is commonly recognized that the important role of processing is to treat excess fruit from the market and also to convert deteriorated fruit to some form of product for value addition. Due to the lack of an appropriate collection and distribution system, however, the processed products are until now marketable only in communities located nearby production areas. To export such products to international market, it is indispensable to apply a contract farming system in which the quantity, quality and delivery time of the produce shall be clearly specified in order to ensure constant supply of raw materials for processing.

#### 2. PRESENT CONDITION AND CONSTRAINTS OF POST-HARVEST HANDLING IN PROVINCES

#### 2.1 North Sumatra Province

The production of tropical fruit in North Sumatra in the last five years is summarized in Table C2.1.

					(Unit: ton)
Fruit	1992	1993	1994	1995	1996
Durian	43,556	44,347	46,599	45,040	48,546
Mangosteen	611	926	792	1,983	2,084
Marquisa	2,181	3,289	3,998	8,378	n.a.
Rambutan	10,639	12,821	13,603	13,954	14,276
Salak	61,258	77,411	57,353	79,233	79,987

Table C2.1 Tropical Fruit Production in North Sumatra

Source : JICA Survey Team, Dec. 1997

Among the selected tropical fruits, durian, rambutan and salak show stable increase in yearly production with slight fluctuation. Production statistics are not fully available for marquisa and mangosteen. Their yearly production still remains at a lower level. At one of mangosteen production areas in Tapanuli Selatan District, a PPL/collector said that farmers became aware of the economic advantage of growing mangosteen trees a few years ago and they have just begun to spread NPK fertilizer.

The production of <u>mangosteen</u> in 1996 was merely 934 tons and most by distributed to urban areas such as Medan and Jakarta. Super quality mangosteen is exported to Singapore and Malaysia through traders. The quality should be smooth skin without any traces of scab. There

are no storage and packing houses in the production area. Traders handle the fruit with returnable clear plastic basket.

<u>Salak</u> production is the biggest among the selected tropical fruits in the Province. Some salak farmers in the production area adopt the "Ijon system" that is selling fruit while it is still on the tree, while salak farmers in Kec. Padangsidempuan Barat have established the "Development Centre" by themselves. There is a big difference in farm gate price between the Ijon system's salak and the Development Center's salak.

Durian farmers in Dairi harvest the fruit by themselves but there are no packing houses in the production area. Since only 30% of durian harvested is sold in the local market, most product is to be transported to urban areas. The transportation cost is usually very expensive: Transport by 2-ton pick up trucks owned by traders/collectors over a distance of 170 km form Dairi to Medan costs Rp. 200,000 to 300,000. The higher transportation cost reduces the farm gate price in remote production areas, that is the major constraint for producer farmers. The farm gate price of durian in Dairi is Rp. 1,500 per piece while that in Langkat District, which is about 55 km north of Medan is Rp. 4,000 per piece.

The production quantity of <u>marquisa</u> in Karo District amounted to 8,244 tons in 1996. There is a market both in Brastagi and Medan. The market in Brastagi supplies raw material for juice/syrup processing and that in Medan supplies fresh fruit and raw material for juice/syrup processing. Since the distance from the production area to Medan is less than 100 km, there are no particular difficulties for post-harvest handling and packaging.

<u>Rambutan</u> production has increased steady year by year in the Province and amounted 14,276 tons in 1996. The production in Langkat District is 3,792 tons which accounts for about 26% of the provincial share. Although 80% of rambutan growers practice mainly paddy farming, they are very active and have a keen interest in expanding their farmland and in applying irrigation system in order to extend the harvest season. There is a collection center in Kee. Binjei that was installed by collectors. Most farmers bring their crops to the collection centre for selling. Sorting, grading and bunching are carried out by collectors. Accordingly, there seems to be no constraint on post-harvest handling for farmers.

<u>Salak</u> growing farmers in Tapanuli Selatan District have the same constraint as durian growing farmers in Dairi District. Because there is no commercial value of <u>salak</u> in producing area, most product should be transported to Medan which is 380 km from Padangsidempuan, a local capital. Some portion is also transported to Jakarta by truck and ferry boat. It takes about 2 days and this long transportation affects significantly the shelf life of salak. Packaging of salak is usually made with traditional natural fiber woven bags of 25 kg that are not effective for deterioration prevention during transportation.

The life of <u>mangosteen</u> is not so long at ambient temperature, that is 3 days for red skin fruit and 8 days for yellow skin one. Fastest transportation to the market is therefore indispensable. Recently 5 regular flights become available weekly between Padansidempuan and Medan. Fortunately, the difference between the price in the Kramat Jati wholesale market in Jakarta and the farm gate price at Tapanuli Selatan could cover the transportation cost at present as shown in Table C2.2.

Table C2.2 Difference Between Urban Market Price and Farm Gate Price

Farm Gate Price (Rp/kg)	Kramat Jat	i Wholesale Mar	ket (Rp/kg)
Tapanuli Selatan	Oct. '96	Nov. '96	Dec. '96
2,000	2,319	2,661	2,661

Source : Laporan; Bulanan dan tahunan Perkembangan Harga & Tonage Sayur Mayur dan Buah-Buahan, Pasar Induk Kramat Jati Jakarta, 1996

#### 2.2 West Java Province

The characteristic of fruit market in West Java is that demand always exceeds supply in the Province. Since the fruit produced in the Province is not sufficient to supply a huge market in adjacent D.K.I. Jakarta, it is necessary to import fruit from outside the Province to meet the demand throughout the year.

Table C2.3 shows the statistics of fruit production except mangosteen in the last five years as recorded by the Provincial Agricultural Services Office in Bandung.

	Table C2.5	TTOPICAL TTO			(Unit: to
Fruit	1992	1993	1994	1995	1996
Avocado	42,853	39,811	43,305	39,415	105,161
Duku	19,341	21,219	8,268	12,281	18,666
Durian	68,674	44,724	33,712	47,185	135,693
Mango	179,219	90,980	114,564	188,624	122,449
Mangosteen	n.a.	n.a.	n.a.	n.a.	2,520
Salak	146,352	96,300	247,507	61,022	118,207

Source: Provincial Agricultural Services Office of West Java, Bandung, Dec. 1997

As clearly shown from the table, the production of avocado, duku, durian and salak has fluctuated fairly largely year by year. Rich harvest occurrs only every two or three years mainly due to poor farm management.

Avocado production in Bandung District was 32,108 tons in 1996 which accounted for about 30% of the provincial production. The major constraint for farmers is the price fluctuation due to difficulties of marketing. The average farm gate price is Rp. 200/kg, but it varies in a range of Rp. 500/kg to Rp. 50/kg. In the peak season, farmers do not like to harvest the fruit because of the labour cost required for harvesting is higher than the farm gate price.

<u>Duku</u> is not so popular and its production totals about 111,000 tons in which the production in Kalimantan is the biggest, followed by that in Sumatra. In West Java, most duku trees in Ciamis District are naturally grown tall trees of more than 25 years old. Farmers adopt the "Tebasan system" that is a contract with collectors coming from urban areas for harvesting. Sorting and grading are carried out by collectors not by producer farmers. Neither collection center nor storage facility exists in the village.

The <u>durian</u> production area in Bogor District is a remote area isolated from the main road connecting Bogor to Jasinga and the condition of access road is extremely poor. Harvested durian should be carried by hand and delivered on foot to the nearby rural market. But the farm gate price of durian is rather high, that is Rp. 6000/piece, because the rural market is located close to big markets such as Bogor and Jakarta. There are no storage and packing houses in the village. If compared with the farm gate price of durian in Dairi, the price in Bogor is more than 4 times higher.

<u>Mango</u> is one of the typical tropical fruits in Java and its production in Java occupies about 64% of the total production in Indonesia. The constraints for mango growing farmers in Sumedang District in West Java are the following:

- 1) The trees are too high, therefore special tools are needed for harvesting.
- 2) Field transportation means such as cart are needed.
- 3) Packaging material is available in the rural area but it requires additional cost.

- 4) Currently sorting and grading are carried out at home by farmers' groups. There are problems for space.
- 5) Sometimes there is damage by insect and stem borer; application of pesticide is required.

The above-mentioned constraints are more or less in the same situation as other fruits.

<u>Mangosteen</u> in Purwakarta District has the same constraint at the time of harvesting. Most trees are too old and too high, and farmers have to pay Rp. 200/kg as labor cost for climbing up and picking fruit on trees to avoid damage to fruit. After harvesting, the fruit is sorted and graded by collectors according to the fruit size and appearance (color and cleanliness of skin). First class fruit is exported to Hongkong by air cargo. Indonesian Foreign Trade Statistics show that the quantity of mangosteen exported from Soekarno Hatta International Airport amounted to 221 tons in 1996, which consisted mainly of fruit produced in Purwakarta. At present, the ratio of first class fruit is merely 25% to 30%. It is strongly expected by farmers to improve the fruit quality, i.e. size, uniformity and clean appearance.

<u>Salak</u> produced in Tasikmalaya has already acquired its market in Bandung and Jakarta under the brand name of Manon Jaya. The production quantity reached 106,619 tons in 1996. The peak season is December and January and the farm gate price is Rp. 400/kg but it increases up to Rp. 700/kg in the dry season.

There are three varieties of mango grown in Sumedang District. Their farm gate prices by grade are summarized in Table C2.4

Grade	Arumanis	Gedong	Local
A	Rp. 3,000/Rp. 1,000	Rp. 5,000/Rp. 1,000	Rp. 2,000/Rp. 800
В	Rp. 2,000/Rp. 500	Rp. 4,000/Rp. 500	Rp. 1,500/Rp. 400
С	Rp. 1,000/no price	Rp. 3,000/no price	Rp. 1,000/no price

Table C2.4 Comparison of Farm Gate Price of Mango by Variety and by Grade

Source: JICA Study Team (information collected in December 1997)

The selection of varieties to be planted in the newly developed area shall require serious market research on the preference of consumers before implementation of the Project.

#### 2.3 East Java Province

The statistics on tropical fruit production in East Java are summarized in Table C2.5.

Table C2.5 Tropical Fruit Production in East Java

					Unit:
Commodity	1992	1993	1994	1995	1996
Avocado	21,638	34,678	28,675	41,163	62,711
Banana	507,199	461,757	537,999	673,999	685,604
Duku	n.a.	n.a.	3,408	6,506	3,399
Durian	19,059	15,995	23,724	24,822	31,120
Mango	350,668	393,907	459,192	478,118	534,741
Salak	20,218	24,949	8,393	48,298	40,671

Source: Propinsi Jawa Timur Dalam Angka, Sub Sektor Tanaman Pangan; 1997

As clearly shown in the table, the production of avocado, banana and mango is dominant in East Java, while that of duku, durian and salak is not so large, and statistics on duku are not available in full. A large quantity of mango is transported directly to the supermarket in Jakarta and some portion of banana is used as raw material for purce processing. In general, it can be said that supply and demand are well balanced.

<u>Avocado</u> production in the Province is increasing year by year. The farm gate price in Lumajang varies from Rp. 800 to 1,600/kg in the big harvest season, that is from January to February. There is another small season from May to June. The constraints for farmers are marketing and transportation. The average retail price of avocado in East Java was Rp. 1,114/kg in 1996 according to the statistics published by the Provincial Agricultural Services Office. There seems to be not so much price difference between the farm gate price in Lumajang and the average retail price in East Java. This is the reason for marketing constraint. Another constraint is the distance to the market. The distance from Lumajang to Surabaya is 140 km and that to Jakarta is more than 800 km. High transportation cost will naturally affect the farm gate price. There are no packing houses in Lumajang.

Banana production is the biggest among tropical fruit in the Province because it can be harvested throughout the year. There are two varieties of banana. One is Cavendish grown in Jombang District that is used as raw material for puree processing at Mojokerto. Another is Agung, a local variety grown in Lumajang. This is sold in fresh condition or used for traditional crispy processing. There are many small scale processors of fried chips and crispy in the Province. Cavendish banana is purchased by the processors at contract price.

Duku growing farmers in Tulungagung District adopted the "Ijon system" in harvesting. The Provincial Agricultural Services Office mentioned that duku in Tulungagung is a specific local variety which has special taste and flavor. It also has a very stable market. But statistics show that the production is not so large and it fluctuates significantly year by year. The farming technology seems very poor. No sorting and grading are done by collectors under the Ijon system. Accordingly, some traders sell duku mixed with Lanzon which is far inferior in quality and is cheaper than duku. As previously mentioned, duku is not so familiar with urban consumers in Java because the major production area is Kalimantan and Sumatra.

Durian production in Trenggalek District is still very low and its history is quite new, because the area was previously planted with cloves. Due to small demand and cheaper international price, the Provincial Agricultural Services Office recommended farmers to shift the durian plantation instead of clove trees. The constraints for farmers are: 1) Long distance to the urban market (170 km to Surabaya), and 2) The land is very steep and it needs soil conservation. As a matter of fact, the farm gate price of durian is the cheapest among the Provinces under study.

Mango production in East Java is growing rapidly year by year and now it occupies the biggest share in Indonesia. It is attributed to the many reasons. One is that the agroclimate in East Java is most suitable for mango growing and another reason is the development of large mango plantations by the private sector. The survey of typical mango plantations is summarized in Table C2.6. The only variety is Arumanis and every company owns its brand name for marketing. They have their own standards of post-harvest handling including packaging. Post-harvest treatment comprises sorting, washing, heat treatment, grading and packaging. Packaging is done with carton boxes a maximum weight of 20 kg. The boxes are provided with ventilation holes and inside buffer paper inside so as to avoid damage during transportation. It is expected that such a high level handling procedure could be disseminated among small-scale mango growing farmers in the Province.

Plantation Company	Estate Size	Market
PT. Galasari Gunungswadaya	310 ha (Drip irrigation)	Surabaya, Jakarta, Export
PT. Kebun Grati Agung	150 ha (Rainfed)	Surabaya, Jakarta, Export
PT. Sata Harum	100 ha (Rainfed)	Jakarta (Supermarket)

Table C2.6 Size and Market of Mango Plantation Companies

Source: JICA Survey Team, Dec. 1997

Indonesian Foreign Trade Statistics-Export show that a quantity of 566.3 tons of mango was exported in 1996, of which 198.6 tons were shipped from Tg. Perak Surabaya and 162.8 tons from Surabaya Airport. This means 64% of exported mango is from East Java. Government support such as sales promotion shall be greatly expected if the companies hope to increase export quantity and to obtain foreign exchange.

<u>Salak</u> production fluctuates significantly year by year and farmers in Malang District have various constraints. They are 1) Difficulty to get quality seedling for production of homogeneous fruit, 2) Absence of irrigation facilities to enable production throughout the year, and 3) Necessity of marketing in peak season. The shelf life of salak at ambient temperature is said to be only three days and there are no data on its shelf life in the most suitable cold storage condition.

The development of fruit industry in East Java has been attributed to the activities of ASPERTI (Horticulture Marketer Association). Their activities cover not only marketing but also standardization consisting of better seedling, improved farming, post-harvest handling, and packaging. This is a good example for fruit growing farmers to organize an association to conduct various works and procedures jointly by groups.

#### 2.4 South Sulawesi Province

South Sulawesi is called "Food Crop Province" and the production of paddy, palawija crops and vegetables is dominant. The fruit production is also increasing recently but its technology is far behind that of paddy and palawija. The production in the last five years is shown in Table C2.7.

					(Unit: tor
Fruit	1992	1993	1994	1995	1996
Avocado	750	6,206	5,658	5,615	8,407
Mango	14,899	169,201	81,898	116,594	108,937
Mangosteen	n.a.	n.a.	n.a.	33	6
Marquisa	18,750	28,538	30,824	38,824	34,217
Rambutan	1,167	4,947	9,194	6,919	2,850

Table C2.7 Tropical Fruit Production in South Sulawesi

Source: Sulawesi Selatan Dalam Angka, 1995; JICA Survey Team, Dec. 1997

As clearly shown in the table, there was a significant fluctuation of the production quantity in each year. No statistics on mangosteen were available before 1994. This means mangosteen growing is quite new in the Province.

Farmers in Gowa District have an option either to grow vegetables or avocado and marquisa. The distance to the urban area is rather closer than any other area. There is a large market consuming vegetables in the urban area, and moreover there are a lot of home industries to utilizing marquisa for juice processing. Accordingly, constant production of avocado seems difficult if there is a stable market to absorb its production. Farmers in Soppeng District grow avocado trees together with cacao, salak, banana, black pepper, and cashew. The competition with cacao growing constitutes a future constraint for avocado farming expansion.

<u>Mango</u> production is the biggest among tropical fruits in South Sulawesi, reaching 108,000 tons in 1996. Since the consumption in the Province is not so large, most mango shall be transported to other provinces in Sulawesi or to Kalimantan by ferry boat through Manuju. The present production in the planned area and its market are summarized in Table C2.8.

Potential District	Present production/Total production	(Unit: ton) Market
Bone	60,077/108,937	Ujung Pandang, Kendari, Manado
Majene	1,124/108,937	Local
Maros	1,996/108,937	Ujung Pandang, Ambon, Manado
Sidrap	3,702/108,937	Ujung Pandang, Kalimantan
Wajo	9,946/108,.937	Ujung Pandang, Kalimantan

 Table C2.8
 Mango Production in Potential Districts and Present Markets

Source: JICA Survey Team, Aug. - Dec. 1997

Most farmers in South Sulawesi never do sorting, grading, and packaging. Collectors bring packaging materials to farms to buy fruit. Such materials are mostly traditional wooden crates, bamboo baskets or used cigarettes carton boxes. Since there are no walls inside the boxes or baskets, and usually their capacity is too large such as 50 or 100 kg, it is inconvenient to carry them and the fruits, particularly those pleased at the bottom fruit are easily damaged.

Future development of mango production in South Sulawesi will depend on how growers can acquire the market through inter-insular trade. The distance of transportation will be longer and longer from now on. The significance of post-harvest handling will thus become much important. Table C2.9 shows the volume of farm products transported by ferry from Manuju to Kalimantan.

	Rice	Corn	Soybean	Vegetable	Fruit
1995	578	299	2,027	394	201
1996	1,183	226	1,086	2,033	430
1997*	588	195	725	1,929	800

 Table C2.9 Volume of Shipments from Mamuju to Balikpapan

 (Unit: ton)

Source: Daftar; Kepala DINAS Pertanian Tan. Pangan., Mamuju

Note: \*The figures of 1997 are as of the end of September.

<u>Mangosteen</u> growing is quite new in the Province as previously mentioned and its production quantity is still quite small. There are big markets in urban areas as well as in tourist hotels in rural areas. The constraint for farmers is not post-harvest handling but the procurement of good quality seedlings for the expansion of their orchards.

<u>Marquisa</u> production is widely practiced in Gowa and Tana Toraja Districts. There are juice processing factories in the both districts. As previously mentioned, farmers in Gowa have an option to grow either vegetables or marquisa/ avocado. In Tana Toraja, however, as most land is steep hill, marquisa growing is the only choice to survive for farmers with coffee growing. Since Tana Toraja is the base of foreign tourists, there is enough opportunity of marketing marquisa as fresh fruit and juice together with fresh mangosteen. <u>Rambutan</u> supply is in deficiency in South Sulawesi. The production quantity is not so large and fluctuates substantially each year. The local government recommended to shift from Cacao farming to rambutan because of high agroclimatic suitability particularly in Mamuju District. Since there is high demand from the urban area at present, no constraint has been observed as to post-harvest handling. There are no packing house and collection center in any of the villages in the Province.

# 3. PRESENT CONDITION AND CONSTRAINTS TO FRUIT PRODUCTION IN PROVINCES

#### 3.1 North Sumatra Province

Marquisa is the only fruit to be processed as juice/syrup in North Sumatra. There are two kinds of processors in the production area, Karo District. One is small scale processors operated by farmers' groups which have a capacity to treat one ton of marquisa per day and to produce 200 litres of syrup. The process flow is as follows:

Receiving  $\rightarrow$  Washing with hot water  $\rightarrow$  Cutting $\rightarrow$  Squeezing with spoon (manual)  $\rightarrow$ Adding the same volume of water  $\rightarrow$  Centrifugal separation  $\rightarrow$  Raw juice  $\rightarrow$  Boiling for 1 hour  $\rightarrow$  Adding 1 kg of sugar to 1 litre of juice  $\rightarrow$  Bottling (500 ml)  $\rightarrow$  Sterilisation  $\rightarrow$ Capping  $\rightarrow$  Distribution to market

The total investment cost was Rp. 15 million in 1995, financed by a credit from the Provincial Agricultural Services Office in Medan with a repayment term of 5 years. Although the operators face the constraint of price fluctuation of marquisa, they hope to expand their processing capacity.

Another kind is medium size processors that process 500 tons of marquisa in one season and produce 150 tons of raw juice. Marquisa is harvested in two seasons in Karo, that is from April to June and from October to December. The processor operators keep good contact with chiefs of villages and let them know in advance the quantity of marquisa required and its purchasing price. Accordingly, they never suffer shortage of raw material supply since their operation began 10 years before.

Marquisa growing is competing with Valencia orange growing. The processor operators have no choice in selecting fruit of standard specification. The quality of juice is adjusted by blending raw juice previously produced and stocked. The product specification is as follows:

A-super	Sugar content:	more than 63%
B	» :	more than 42% and less than 63%
С	• •	more than 20% and less than 42%

A-super class fruit is being exported to Singapore and the United Kingdom. The process flow is as follows:

Receiving  $\rightarrow$  Cutting the top of fruit  $\rightarrow$  Squeezing by machine  $\rightarrow$  Centrifugation  $\rightarrow$  Storage (raw juice)  $\rightarrow$  Mixing/Blending  $\rightarrow$  Centrifugation  $\rightarrow$  Bottling  $\rightarrow$  Market

All machineries are simple and made in Indonesia according to the operators' own design. Marquisa processing is a typical home industry with a fairly large capacity. It employs 20 permanent workers and in the peak season more 50 workers are recruited temporarily. This is contributing to the increase in employment opportunities in the rural area. It is one of the desirable industries for rural development. There are no other fruit processors in North Sumatra than the four marquisa juice processors in Medan.

#### 3.2 West Java Province

There are a lot of agro-processing factories in West Java such as canning of mushroom, asparagus, and pineapple. But fruit juice processors are quite few. PT. Ultra Jaya is one of the typical fruit juice processors located in Bandung. The main business of PT. Ultra Jaya is production of dairy milk and mixed milk and chocolate. It is treating 80 tons of fresh milk every day. It has 24 Tetra Pack lines for marketable products instead of bottling line. In order to utilise these lines, it is producing fruit juice such as apple, orange, strawberry, lychee, jambu, sirsak, pineapple, mango, and guava. Among them, raw materials for apple, orange and lychee juice are imported from the USA, Brazil, EC, and Taiwan. There are domestically produced fruits, but they cannot be used for raw materials from the aspect of taste and need of special processing.

PT. Ultra Jaya buys domestic fruit from collectors and wholesalers who have their own stores. Some examples are as follows:

Pincapple		Juicy pineapple produced in Subang
Mango	-	Juicy mango, variety Kopyor
Guava	-	Produced in Pasar Minggu, Cirebon, Garut; yellow colour preferable

The processing capacity for such domestic fruit is 3 tons per hour. All the equipment is designed and fabricated by an European company and made of stainless steel.

Usually food processing companies have a good quality control laboratory responsible for checking raw materials received and controlling the process and product quality. Two samples are taken in every 10 minutes from the line, and incubated at 35°C whether sterilization is satisfactory or not.

For the processors to be internationally recognized, the application of ISO-9000 is required, but PT. Ultra Jaya is trying to apply the Hazard Analysis Critical Control Point (HACCP) and GMP (Good Manufacturing Practice) that are set by FDA of the USA. Regrettably, company does not have any research and development facility.

#### 3.3 East Java Province

Just like West Java, there are a lot of agro-processing industries in East Java. The characteristic is that there are a fairly large number of banana processors producing dried banana, fried chips, and crispy in the Province. PT. Horti Nusantara is one of the typical banana processors having plantations for their own raw material supply. It has an estate of 100 ha in Mojokerto District growing Cavendish banana to be processed as puree. The area is divided into 25 ha as a nucleus farm cultivated by the company and 75 ha of corporate farmers.

PT. Horti Nusantara was established in 1995. Due to shortage of raw material, puree production in 1996 was merely 156 tons, that is less than 2% of the nominal production capacity. The company can process 4 tons of raw material per hour which can yield 2 tons of puree. Their nominal capacity is 12,600 tons with a two-shift working system. The process flow of puree manufacturing is summarised below:

Banana receiving  $\rightarrow$  Washing  $\rightarrow$  Peeling skin by hand  $\rightarrow$  Cluster  $\rightarrow$  Degassing vessel  $\rightarrow$  Homogenizer  $\rightarrow$  Sterilization by heat exchanger  $\rightarrow$  Aseptic packaging (200 kg drum or 20 kg box)

All processing equipment is made of stainless steel by an European company. Puree is exported to EC through Rotterdam as raw material for baby food.

The company is trying to increase the number of contract farmers who grow Cavendish banana and supply it to its factory. Now there are about 100 farmers in Mojokerto, 150 farmers in Malang, and 30 in Jombang. PT. Horti Nusantara is also growing 350,000 Cavendish seedlings by tissue culture.

#### 3.4 South Sulawesi Province

There are about 30 marquisa juice processors in South Sulawesi. Three of them are in Gowa District and two in Tana Toraja which are the major marquisa growing areas. No other agroprocessing facilities exist in the Province. The Province's food processing industry is lagging far behind other provinces even though it has plenty of agricultural products.

The biggest processor, PT. Marquisa Segar was established 7 years ago at Malino in Gowa District. Its nominal capacity is 4 tons for marquisa treatment and 1 ton for juice production per hour but since the establishment it has never run at full capacity due to shortage of raw material. In 1997, the factory operated intermittently from February to September and the efficiency was only 5% of its capacity. All the processing equipment has been designed and fabricated by European companies and made of stainless steel.

The company buys marquisa from collectors but the payment is made only one month after delivery. Most farmers like cash payment on delivery. Malino is located in highland where vegetable farming is most suitable from the agro-climatic viewpoint. Farmers have an option to grow either marquisa or vegetables which can easily be convertible to cash. There is a lack of motivation for farmers to grow marquisa for the processor. This is the major reason why PT. Marquisa Segar cannot acquire enough raw material.

There is another processor called PT. Karya Kita in Ujung Pandang. It has marquisa fields in both Gowa and Tana Toraja, from where it can get more than 50% of raw material for juice processing. The issue of management for PT. Marquisa Segar is how to get enough raw material. This is not a problem due to lack of capital, but lack of enterpreneurship.

#### 3.5 Conclusion

From the aspect of processing, fruit can be classified into the following categories: 1) Dried fruit, 2) Fruit juice, 3) Canned fruit/frozen fruit, and 4) raw material for processed food.

The required process can be summarized in Table C3.1. together with the processed products.

	Class 1	Class 2	Class 3
Process	Milling, Cutting, Mixing, Drying, Pressing	Cooking, Pasturization, Canning, Freezing	Chemical alteration, Texturization
Product	Dried fruit, Fruit juice	Canned fruit, Frozen fruit	Raw materials for processed food, Baby food, Pet food

Table C3.1 Processed Fruit by Processing Method

In the table, the level of processing technology and investment required become higher from the left column to the right. At present, fruit juice, canned fruit and a small amount of baby food can be processed in Indonesia. In 1995, total processed food exported from Indonesia amounted US\$50 million, of which 90% consisted of packed pineapple. Among the selected tropical fruits to be studied, only marquisa syrup/juice has an established foreign market. It is strongly recommended that efforts should be continued to increase foreign exchange earnings by exporting marquisa syrup/juice.

The next possibility is to process mango and avocado in the form of syrup or puree. The reason is that in the case of avocado, there is excess production and farmers often suffer cheap farm gate prices. The same situation is observed in mango production at Sumedang in West Java. In the peak season, the price of even first grade mango becomes extremely low. Some kind of processing should therefore be considered for value addition. A similar situation for mango is expected in South Sulawesi, because there are so many plans of expansion of fields while the market is very limited in the Island. Simple processing to manufacture dried mango is the most recommendable for the processing method for the remote areas. Durian and salak are processed only in the form of traditional sweet "Manisan". For mangosteen, it would be far better to export it as fresh fruit than processed fruit. Duku is a very sensitive fruit and its processing seems very difficult.

To set up new processing facilities, following items should be clarified during the Study:

- 1) What is the most realizable processing capacity considering the locally available raw material?
- 2) How much capital is required for facilities and land, and where to obtain the fund required?
- 3) Where to get processing technology and its expense?
- 4) Where is the market of products?
- 5) What are the profit and schedule of repayment?

Too many processors in Indonesia are suffering from the shortage of raw material, such as PT. Horti Nusantara in East Java and PT. Marquisa Segar in South Sulawesi. However, a large home industry processing marquisa juice in Karo, North Sumatra, has good relationship with marquisa growers. Under a contract farming system, in which a mutual agreement on the supply quantity and purchasing price is reached in advance. In such condition, the industry has never suffered from the shortage of raw material. This is a matter of management and entrepreneurship.

The most recommendable fruit processing industry for Indonesia is not large scale but medium scale home industry to use local machineries and also to use manual labours to some extent to increase rural employment opportunities. Processing facilities shall be installed in rural areas where raw material is available. Further processing operations, such as refining and bottling shall be done in urban areas to avoid expensive transportation cost.

#### 4. GENERAL CONCEPT OF POST-HARVEST HANDLING

#### 4.1 Significance of Pre-harvest Handling

Proper post-harvest handling would not improve the quality of fruit after it is harvested, but only extend its shelf life. Post-harvest handling activities consist of harvesting, sorting, grading, packaging, storage, and distribution in such a way to avoid infestation and damage during transportation. It should be noted that pre-harvest management such as soil suitability, good seedling, better agro-climate, proper fertilization, watering and proper pesticide application has more significance than post-harvest handling. To avoid yearly fluctuation of the production quantity through proper farm management is also important. Stable supply of raw material in terms of quantity and price is indispensable for the development of fruit processing industry.

#### 4.2 Harvesting

Planning of crop selection and timing to meet expected market requirements is most important. Since most tropical fruit trees are perennial, farm management activities such as pruning, training, flower thinning, and fruit thinning would seriously affect fruit bearing condition. Another practices like watering and fertilizing are also useful. Usually it is easier to fasten harvesting time than to delay it. Then, judgment of fruit maturity is important and this is decided by visual observation of color change on fruit skin and by counting the number of days after flowering. But for the fruit requiring long transportation such as mangosteen and mango for export, the fruit should be harvested before its full maturity.

Under this Study, mango Brix was tested at a collection centre in Pasuruan and Probolingo in East Java. The Brix value of matured mango (Arumanis) was around 18, but the same mango for export purpose showed a Brix of 8 to 9, that is about 70% of maturity. After six days at ambient temperature, Brix increases to 18 to 19, that is full maturity. Harvesting should be done taking into account the time necessary for transportation.

The basic rules for harvesting are:

- To harvest during the coolest part of the day: early morning or late afternoon.
- To do not harvest when it is wet. Wet fruit will be overheated if not well ventilated, and will be more likely to decay.
- To protect harvested produce in the field by putting it under open-sided shade.

Harvesting is usually carried out by hand but sometimes it needs mechanical aid such as special tool for collecting fruit from tall trees. A fee is to be paid for collection by climbing up tall mangosteen trees. In Purwakarta, West Java, such a fee is Rp. 200/kg.

#### 4.3 Sorting

Preliminary sorting of the produce should remove unmarketable pieces and foreign matters such as plant debris, soil or stones. Unmarketable pieces mean damaged fruit due to overripening, infected fruit and fruit having scabs and dots. At present, such sorting is not done by almost farmers except a few plantation estates. Particularly, small scale farmers are apt to adopt the Tebasan or Ijon system for harvesting of small fruit such as duku and salak. They are loosing opportunity to add value to their produces.

#### 4.4 Grading

The fruit quality standards have been set or are under preparation by the Ministry of Agriculture. Some fruits are classified by weight but some are by diameter. Following are some examples:

		······································		(Unit: gram
Cultivar	Big	Medium	Small	Very small
Aromanis	>400	350 - 400	300 - 349	250-299
Golek	>500	450 - 500	400 - 499	350 - 399
Gedong	>250	200 - 250	150 - 199	100 - 149
Manalagi	>400	350 - 400	300 - 349	250 - 299

Mango (SP-139-1981; Revision in Feb. 1991)

Salak (SP-142-1981)

Big size	Medium size	Smalt size
more than 61 grams	33 - 61 grams	less than 32 grams

#### Avocado (SP-142-1981)

Big size	Medium size	Small size
451 - 550 grams	351 - 450 grams	250 - 350 grams

Mangosteen (under preparation)

Superior	1	Ιί
>65 mm	55 - 65 mm	<55 mm

Rambutan (under preparation)

Cultivar	Big (number/kg)	Small (number/kg)
Binjai	Max. 20	>20
Lebak Bulus	Max. 35	>35
Rapiah	Max. 30	>30
Simacan	Max. 40	>40

Ambon banana (under preparation)

Specification	Unit	A	В	С
Length of finger	cm	18.1 - 20.0	16.1 - 18.0	14.1 - 16.0
Weight of hand	kg	>3.0	2.5 - 3.0	<2.5
Diameter of fruit	cm	>2.5	>2.5	<2.5

The grading standard of durian by fruit shape is also under preparation. There are 4 categories for 11 types of fruit shape, namely A: Very good shape 5 types; B: Good shape 3 types; C: Less good shape 2 types; and D: Not good shape 3 types. There are grading standards by weight for the A, B and C categories.

According to the survey results, farmers do not grade fruit by weighing except large mango estates. Most farmers only check their fruit by visual inspection and classify it into large size, middle size, and small size. Sometimes, their standard is the circumference of fruit determined by the length of palm and fingers. Dissemination of the governmental specification to small scale farmers is most important for nation wide standardization of fruit.

#### 4.5 Packaging

The standard specification has also been prepared by the Ministry of Agriculture for mangosteen, Ambon banana, rambutan and durian. It is summarised is as follows:

Mangosteen: Fresh mangosteen fruit is packaged with carton boxes or plastic baskets, which are strong, fine, clean and dry, as well as ventilated.

<u>Ambon banana</u>: Fresh yellow Ambon banana fruit is packaged in carton boxes or other packaging materials, which are strong, good and clean. Each box is layered with polyethylene plastic of 0.01 num thick. Each box is filled with 10 - 13 kg of hands or parts of hands of fresh Ambon banana fruit, or in accordance with the market demand.

<u>Rambutan</u>: Fresh rambutan fruit is presented in bunch or apart and wrapped with paper, plastic net, etc. as well as packaged with bamboo or carton boxes with or without supports, with a net weight of 10 kg at maximum.

<u>Durian</u>: Durian fruit is packaged in accordance with the market demand. European, USA and Canadian markets prefer 2.5 - 3.5 kg durian fruit packaged in carton boxes up to 10 - 12 kg. The Hongkong market selects 2 - 4 kg durian fruit packaged in wood baskets up to 35 - 50 kg, while the Singapore market or local market prefer 2.0 - 5.0 kg durian fruit packaged in wood baskets or wood boxes or unpackaged.

As clearly shown from the above, the Ministry of Agriculture hopes to shift to smaller size packaging instead of traditional packaging. Education of farmers and collectors is indispensable to enable them to familiarize themselves with and adopt the new packaging standard.

For reference, the packaging standards for various fruits set by the Farmers Cooperation in Japan are summarized below:

Hard skin fruit (apple)

No	Volume	Stage	Length	Width
1	15 kg	3	430 mm	360 mm
2	10 kg	2	430 mm	360 mm

Material: Corrugated cardboard

Soft skin fruit (mandarin, orange)

Volume	Length	Width	Depth
15 kg	360 mm	300 mm	250 տա
10 kg	360 mm	300 mm	170 mm

Material: Corrugated cardboard

#### Soft and small fruit (grape)

No	Volume	Length	Width	Depth
1	4 kg	380 mm	260 mm	90 - 110 mm
2	4 kg	420 mm	270 mm	90 - 110 mm
3	4 kg	455 mm	265 mm	100 - 130 mm
4	4 kg	460 mm	280 mm	90 - 110 mm

Material: Corrugated cardboard

The case of hard skin fruit applies to avocado and mangosteen; soft skin fruit to mango; and soft and small skin fruit to duku, rambutan, and salak.

#### 4.6 Storage

No storage facilities to preserve harvested fruit have ever been seen in villages in Indonesia. Usually, harvested fruit is transported promptly from the field by collectors/traders to the market.

There are some cold storages at Pasar Kramat Jati in Jakarta, Pasar Induk Caringin in Bandung, a fruit store of ASPERTI in Surabaya, a fruit supermarket in Medan, and a fruit wholesaler in

Ujung Pandang. The facilities are utilized mainly for storing imported fruit and some are utilized for preserving fruit for export purpose.

Every fruit has its optimum cold storage temperature at which its shelf life can be extended as shown in the Table C4.1.

Fruit	Post-harvest life at optimum temperature (days)	Optimum storage temperature (°C)
Avocado - Mexican	14 - 28	5
- West Indian	14 - 28	10
Banana	7 - 28	14
Durian	42 - 56	4
Duku/Langsat	10 - 15	1
Mango	14 - 25	10 - 12
Passion fruit	14 - 21	12
Rambutan	7 - 21	12

Table C4.1 Shelf Life at Optimum Temperature

Source: Robert E. Psull, AICAR Proceedings No. 50; Published in July 1993 ISBN 1 86320-101-7

There are no data on mangosteen and salak.

#### 4.7 Transportation

Since most production areas of tropical fruit are located far from urban areas, the cost for transportation cannot be ignored from the viewpoint of marketing. Some examples surveyed in this Study from August to December 1997 are shown below:

North Sumaira

Durian	Dairi - Medan (170 km)
2-ton pickup truck	Rp. 200,000 to 300,000

#### West Java

Avocado	Bali - Bandung	
S-ton truck	Rp. 750,000 (30 hrs)	
7-ton truck	Rp. 1,020,000 (40 - 70 hrs)	

East Java

Mango	Probolingo - Surabaya	Surabaya - Jakarta	Total
	Rp. 80/kg (Truck)	Rp. 170/kg (Train)	Rp. 250/kg

South Sulawesi

····· · · · · · · · · · · · · · · · ·	5-ton Truck	10-ton Truck	Pick-up
Fully loaded	Rp. 279,000	Rp. 400,000	Rp. 165,000
Empty	Rp. 236,000	Rp. 305,000	

Ferry boat between Mamuju and Balikpapan

Truck

Fruit	Enrekang - Mamuju (370 km)	
5-ton truck	Rp. 650,000	

The average transportation cost by truck can be estimated at Rp. 1,000/ton.km.

Efforts to minimize the transportation cost are required. For example, the ferry boats coming back from Balikpapan to Mamuju always carry empty trucks. It is desirable to transport some commodities from Kalimantan to South Sulawesi to reduce the transportation cost.

#### 5. FRUIT PROCESSING

Among the nine selected tropical fruits, banana production is the largest and it is already well processed as purce, crispy, fried chip, and dried banana particularly in East Java. Although there are no statistics on quantity at the national level, marquisa is produced in North Sumatra and South Sulawesi. The production quantity is still small, but it is used as raw material for marquisa syrup/pulp and/or juice processing. Durian is processed to dodol when it is in excess in the market. Marquisa and salak are also processed to dodol when they are in excess in the market. A very small quantity of mango is used for juice processing.

Table C5.1 shows the nutrient composition of the selected fruits which were referred to a document published by the Provincial Agricultural Services Office of East Java. The analytical data of marquisa were extracted from a technical bulletin published by FAO.

	Banana	Mango	Rambutan	Salak	Marquisa
Calories	99	46	69	77	92
Protein (gram)	1.2	0.4	0.9	0.4	0.6 - 1.2
Fat (gram)	(0.2)	(0.2)	(0.1)	0	0.1
CHO (gram)	25.8	11.9	18.1	20.9	8 - 16
Ca (mg)	8	15	16	28	-
P (mg)	28	9	16	18	
Fc (mg)	0.5	0.2	0.5	4.2	1
Vitamin A (I.U.)	146	1,200	(0)	0	20
Vitamin B1 (mg)	0.08	(0.08)	0	0.04	0.1
Vitamin C (mg)	3	6	58	2	20 - 45
Water (gram)	72.0	82.2	80.5	78.0	75 - 82
BDD (%)	75	65	40	(50)	-

Table C5.1 Nutrient Composition of Tropical Fruit

Note: The figures are for 100 grams of fruit.

It is interesting to compare the nutrient composition between the fruits. Banana contains high carbohydrate, phosphorus, and Vitamin A. This means banana purce is a good nutrient as baby food. Mango has a very high content of Vitamin A. This means mango is a good food for patients who are suffering from eye disease and good preventive medicine for it. Rambutan contains a very high level of Vitamin C, and salak contains a rather large quantity of minerals such as Calcium and Iron. Marquisa also has a very high Vitamin C content that is cleared from another source.

Similar analyses should be carried out for avocado, duku, durian, and mangosteen. Such analyses will be of great help to promote domestic consumption of tropical fruit and convince the public that the habit to eat fruit is good for maintaining their health.

When processing tropical fruit, various cautions should be taken so as to avoid decomposition of such useful components. As shown in the table, marquisa contains a lot of Vitamin C. All small-scale home industry factories processing marquisa juice sterilize the product by boiling it at 100°C, while large scale home industry factories, Pyramid Unta in Karo, use Sodium Benzoate as a preserve agent and add sugar up to 62% concentration to avoid microbial decay during marketing. The Vitamin C content in the syrup/juice should be determined through analysis to compare the both processes. Also the flavour, that attracts for its palatability, might be greatly different.

It is recommended to process mango by slicing and drying to produce dried Mango. This is a good food to prevent eye disease. The farm economy and social survey results clarified that many rural inhabitants still suffer from eye disease. Dried mango should be an effective counter-measure for it because it is available throughout the year.

It is difficult to process avocado, duku and mangosteen because of their size and taste. The Food Technology Laboratory of Bogor Agricultural University is conducting an experiment on ready-to-eat salak. This is a trial to preserve peeled salak meat by film wrapping. If this trial is successful, it should be applicable to durian.

As to the location of processing plants, it is generally recommendable to locate them in the production areas if utilities are available, while refining or bottling plants should be installed in

urban areas because of expensive transportation cost in Indonesia. The yield of banana puree is 50% and marquisa syrup is 20% to 25% of raw material used by the processing plant. There is no need to transport fruit skin to urban area.

Processed fruit products are earning a large amount of foreign currency in Indonesia as shown in Table C5.2. In 1995 they earned about US\$45 million. Although this amount was mostly from export of canned pineapple and its syrup, it shows a good potential for fruit juice, except frozen citrus juice which is imported from Brazil, and other processed products such as jam and purce. It is urgently required to get worldwide market information.

Fruit Products	Export Vol. (ton)	Export Value US\$ 1,000	Import Vol. (ton)	Import Value US\$ 1,000	Balance Vol. (ton)	Balance Value US\$ 1,000
Pineapple in syrup, airtight packed.	89,403.5	46,373.5	10.4	18.4	89,393.1	46,355.1
Fruit jam, purce and paste	0	0	147.6	212.5	- 147.6	- 212.5
Cherry in syrup, airtight packed.	0	0	369.9	234.3	- 369.9	- 234.3
Fruit juice	3,548.2	3,089.5	89.9	79.7	3,458.3	3,009.8
Tomato juice	0	0	1,078.8	815.8	- 1,078.8	- 815.8
Frozen citrus juice	0	0	641.2	1,160.7	• 641.2	- 1,160.7
Other citrus juice	36.8	27.1	867.6	679.9	- 830.8	- 652.8
Other fruit jam	227.2	185.8	364.4	940.2	- 137.2	- 754.4
Others	1,053.1	644.9	1,287.7	1,100.1	- 234.6	- 455.2
Total	94,268.8	50,320.8	4,857.6	5,241.5	89,411.2	45,079.2

Table C5.2 Balance of Processed Fruit Export and Import (1995)

Source: Vademekum Pamasaran 1986 - 1996, Pusat Promosi dan Informasi; Tanaman Pangan dan Holtikultura

#### 6. BASIC DEVELOPMENT PLAN

#### 6.1 North Sumatra Province

Major constraints for post-harvest handling and processing of tropical fruit in North Sumatra are: 1) Long distance to the urban market where tropical fruit is consumed; 2) Fluctuation of yearly production is fairly large; and 3) Production of mangosteen and marquisa is still very small.

The reason 1) is due to the fact that the rural market is quite small and only 10% to 30% of fruit produce is consumed in the rural area. Accordingly 70% to 90% of it should be transported to the urban area and the distance from Dairi, Tapanuli Selatan, Tapanuli Tengah and Tapanuli Utara to Medan is quite far. It is 170 km, 380 km, 320 km, and 280 km respectively. The shelf life of durian, mangosteen and salak is not so long and these fruits are easily deteriorated during transportation if they are not properly packaged. It was observed in the urban markets in Jakarta and Bandung that durian transported from Sumatra is easily damaged by cracks resulting from heat during transportation

Small production quantity and its yearly fluctuation are other constraints for mangosteen and marquisa in the Province. These can be attributed to less intensive farming practice by small scale farmers in the rural area and not to post-harvest handling. But for the development of processed fruit, such as marquisa syrup/juice, a stable supply in quantity and price is prerequisite.

One solution to this constraint is the improvement of the rural fruit/vegetable market. At typical example was seen at Brastagi market. The land space is provided by the local government, but there is no pavement nor roof. The road in the market is muddy and very dirty. A lot of gabages are discarded near stores. It seems not sanitary to handle fruit/vegetable there for human consumption. From the above mentioned reason, the recommended action programs for North Sumatra are as follows:

Fruit	District	Area planned (ha)	Facilities recommended
Durian	Dairi	300	Storage, packing house
	Tapanuli Tengah	750	- ditto -
	Tapanuli Utara	500	- ditto -
Mangosteen	Tapanuli Selatan	1,800	Packing house
	Tapanuli Utara	500	- ditto -
Marquisa	Karo	1,000	Packing house
Rambutan	Langkat	500	Packing house for export
Salak	Tapanuli Selatan	15,000	Container for transportation

Table C6.1 Proposed Facilities in North Sumatra

The packing house will be a simple structure cottage to be built in the rural village with paved flat floor and roof. Simple facilities of sorting, cleaning, grading and packaging shall be installed inside.

At present, no constraints on post-harvest handling of rambutan were observed because the distance to the urban market is very short compared to those in Tapanuli Selatan District, etc.

The provincial government has already made great efforts to promote domestic fruit consumption and it hold the Medan Fair in last April. Similar fairs were also held in Ipo and Penan in Malaysia in cooperation with private sectors. Such efforts should be continued. At the same time, the government should pay attention to residuales of pesticides on fruit, particularly on fruit for export to developed countries. This is the trend followed worldwide for ensuring food safety.

#### 6.2 West Java Province

Major constraints to post-harvest handling and processing of tropical fruit in West Java are: 1) the demand always exceeds the supply in the Province, and 2) the yearly production fluctuates largely.

The reason 1) derives from the fact that a huge market, DKI Jakarta, is adjacent to the Province. In fact, most tropical fruit sold at the Kramat Jati wholesale market in Jakarta is transported from West Java. On the other hand, fruit sold at the Induk Caringin wholesale market in Bandung is transported from East Java and Bali. Ordinary distribution and marketing systems are required to stabilize fruit prices. The supply of durian, mango and mangosteen is always not sufficient to meet the demand. Accordingly, proper post-harvest handling is essential to avoid losses during transportation and marketing. As to the yearly production, it was observed that duku, mango and salak have good harvest every two or three years. This is attributed to poor farm management, mainly in pre-harvest handling and not in post-harvest handling. Statistics on mangosteen before 1995 are not available although there are a lot of very old trees in the production area.

The recommendable action programs for post-harvest handling are summarized in Table C6.2. The reason why farmers need harvesting tools is that most fruit trees are too tall to pick their fruit by hand. This also comes from poor farming knowledge of small scale fruit growing farmers. They do not understand the necessity of pruning and cutting off branches regularly.

Commodity	District	Area planned (ha)	Pacifities recommended
Avocado	Bandung	500	Packing house, Harvest tools
Daku	Ciamis	500	Packing house, Harvest tools
Durian	Bogor	500	Storage, Harvest tools
Mango	Sumedang	1,000	Packing house, Harvest tools, Cart
Mangosteen	Purwakarta	500	Storage, Packing house
Salak	Tasikmalaya	1,000	Packing house, Harvest tools

Table C6.2 Proposed Facilities in West Java

Another constraint concerns on the importance of processing. This is particularly important for avocado and mango, because in the peak season of both fruits, they become of no value and farmers do not like to harvest them from trees or simply discard them in the field. Some kinds of processing shall be considered at the provincial level, not at the district level.

In connection with processing, the needs for research and development facilities should be focused on the activity of private sectors. The reason comes from the case of PT. Ultra Jaya in Bandung. The company is manufacturing fruit juice in Tetra pack line with raw materials such as frozen citrus juice and apple juice imported from abroad. The raw materials of similar quality are imported available indigenously, but it does not have any facilities for R&D purpose. The replacement of raw materials with domestic ones is indispensable to maintain the business, in view of the rapid devaluation of the Rupiah in very recent days. Some kind of subsidy from the central/provincial government shall be urgently required to assist the company in installing R&D facilities.

#### 6.3 East Java Province

The major constraints on post-harvest handling and processing of tropical fruit in East Java are almost similar to those in West Java. The production of banana and mango is dominant and is growing steady year by year. The production of duku and durian is still small and no data on the past production of duku are available. A severe fluctuation is seen in salak production.

Mango production has increased rapidly and steadily due to the establishment of large estate companies in Gresik, Pasuruan and Probolingo in East Java. All estates have their own brand and product specifications are strictly controlled in accordance with manuals for sorting, grading and packaging. Since the quality of fruit is very high and homogeneous, the companies have direct sales contracts with the supermarket in Jakarta or exported their products to Singapore.

Examples of grading manuals are as follows:

<u>PT. Galasari Gunungswadaya</u>: Harvest  $\rightarrow$  Field shed cottage  $\rightarrow$  Packing house  $\rightarrow$  Sorting  $\rightarrow$  Grading by specific gravity  $\rightarrow$  Drying  $\rightarrow$  Packaging

<u>PT. Sata Harum</u>: Harvest  $\rightarrow$  Sorting  $\rightarrow$  Washing  $\rightarrow$  Heating at 45°C for 3 min.  $\rightarrow$  Drying  $\rightarrow$  Grading by weighing  $\rightarrow$  Packaging

Before packaging, each mango is labeled with a special sticker showing their brand name. The packaging material is carton box with inner partitions and ventilation holes. The packaging size is smaller than that of the traditional container such as bamboo basket and wooden box. The package is 5 kg for gift and 10 kg for supermarket so as to avoid damage during transportation. Such high technology should be disseminated to small scale mango growers nearby.

Although its production is quite small, duku is a very sensitive fruit and when the skin is damaged, the quality of fruit deteriorates very rapidly. Accordingly, special attention is required to be paid to post-harvest handling.

Another constraint for fruit processing in East Java is the shortage of raw material. A typical example is seen in the banana puree processor in Mojokerto. The rate of plant operation is very low due to shortage of raw material. A long term contract system should be applied with farmer producers for smooth operation of the processing factory.

Commodity	District	Area planned (ha)	Facilities recommended
Avocado	Lumajang	1,000	Packing house
Banana	Jombang	500	Packing house
	Lumajang	500	Packing house
Duku	Tulungagung	1,000	Packing house
Ducian	Jombang	1,150	Packing house for remote area
	Trenggalek	1,000	Packing house for remote area
Mango	Pasuruan	750	Cold storage, Packing house
Salak	Malang	1,700	Processing

Table C6.3 Proposed Facilities in East Java

The peak season of salak also need some processing because their shelf life is only few days unless they are stored in cold storage.

#### 6.4 South Sulawesi Province

In general, farmers in South Sulawesi never do sorting and grading. These are done by collectors. Since the marketing channel in the Province is not so well developed and the size of market is rather small, collectors are obliged to transport their fruit products to areas outside the Province. This is the major constraints to post-harvest handling of tropical fruit in South Sulawesi. The Provincial Agricultural Services Office desires to install a local distribution centre in the district with the functions of sorting, grading, and packaging. The function of Market Information Service is also desirable. This distribution centre will connect farmers with collectors/traders. In Ujung Pandang, it is also necessary to have a central wholesale market with cold storage facilities for vegetable and fruit.

Commodity	District	Area planned (ha)	Facility recommendable
Avocado	Gowa	500	Local distribution centre
	Soppeng	500	- ditto -
Mango	Bone	500	- ditto -
	Majene	500	- ditto -
	Maros	500	- ditto -
	Sidrap	500	- ditto -
	Wajo	500	- ditto -
Mangosteen	Polewali	500	- ditto -
	Tana Toraja	500	- ditto -
Marquisa	Gowa	1,000	- ditto -
	Tana Toraja	3,000	- ditto -
Rambutan	Barru	700	- ditto -
	Enrekang	500	- ditto -
	Mamuju	2,350	- ditto -
	Pinrang	500	- ditto -

Table C6.4 Proposed Facilities in South Sulawesi

The local distribution centre will be a structure that has a stage with flat paved floor and roof. Both ends of the staged floor are used for unloading fruit products gathered by farmers nearby and for loading/delivery of traded products by collectors/traders who transport them to the urban market or outside the Province. The middle part of the floor is used for sorting, cleaning, grading, and simple packaging durable for transportation. The Market Information Service should be installed additionally in the centre where the products are transported for efficient marketing.

Since the population of each district in South Sulawesi is far smaller than that of the districts in West Java and East Java, the number of such Distribution Centres should be determined carefully.

No	Name	Address	
1	PT. Maju Jaya	И. Sambas 37, Medan	Marquisa syrup
2	PT. Pintu Besar	Jl. Letjen Hariono, Medan	ibid.
3	PT. Sarang Tawon	JI. Nyak Makam 24, Medan	ibid.
4	PT. Gunung Kawi	JI, Sambas 11, Medan	ibid.
5	PT. Putra Brastagi	II. Thamrin 75/7-F, Medan	Exporter
6	PT. Arfindo Subur	JI. Mangkubumi Dalam 15, Medan	ibid.
7	CV. Karya Tani	JI. Teratai 14-A, Medm	ibid.
8	CV. Gioting Co	JI. Pemuda Baru 7/8, Medan	ibid.
9	CV. Perintis Tani	Jl. Riau 1-C, Kabanjahe	ibid.
10	CV. Tani Makmur	II. Darat 48-B, Kabanjahe	ibid.
11	CV. Dhaksa Putra	Jl. Putri Hijau Baru 31, Medan	ibid.
12	PT. Arinya Karosutama	JI. Asia 220, Medan	ibid.
13	PT. Tenda Mas Nusantara	II. Veteran 18-G, Medan	ibid.
14	PT. Sindung Rianawati	II. Perniagaan 127, Medan	ibid.
15	PT. Bibit Unggul Karo Biotek	JI. Veteran 16-17/48, Medan	ibid.
16	PT. Gunung Lintong	H. Pemuda 22, Medan	ibid.
17	PT. Fajar Utama	II. Kapten Utah Dendi 40, Kabanjahe	ibid.
18	PT. Bayu Bali Exim	JI. Udara, Brastagi	ibid
19	PT. Bibit Bau	II. Iskandar Muda 248-C, Medan	ibid.
20	PT. Selektani	ibid.	ibid.
21	PT. Kurnia Wiratama	JI. Teuku Umar 7/AG, Medan	ibid.

### Table C-1-1 List of Agri-business in North Sumatra

Source: Dinas Pertanian Tanaman Pangan, Sumatera Utara; Sep., 1997

No	Name	Location	Activity
1	PT. International Grand	Kab. Lebak	Banana
2	PT. Carcia Paya Ind.	Kab. Sukabumi	Papain & Pectin
3	PT. International Grand	Kab. Cianjur	Banana & Pineapple
4	PT. International Grand	Kab, Garut	ibid.
5	PT. Inti Hortindotama	Kab. Garut	Juice concentrate
6	PT. Ultra Jaya	Kab. Bandung	Juice concentrate
7	PT. Kbun Mas	Kab. Karawang	Durian, Mango
8	PT. Kertosari Gemilan	Jakarta Pusat	Rambutan, Mangosteen, Avocado / Exporter
9	PT. Purnawangi Maju Jaya	Kab. Bandung	Rambutan, Sirsak, Jeruk, Durian / Exporter
10	PT. Teratai Pangan	Kab. Bekasi	Jeruk
11	PT. Inti Hortidotama	Kab. Karawang	Fresh fruit
12	PT. Morelli Makmur	Kab. Subang	Juice concentrate

Table C-1-2 List of Agri-business in West Java

Source: Dinas Pertanian Tanaman Pangan, Jawa Barat; July, 1996

Ĺ

No	Name	Address	Product
1	Aneka Saos	11. Jenggolo 25, Sidoharjo	Tomato sauce
2	Bahagia	Strengganan Dalem, Sby	Tomato and chili sauce
3	Bangka	Jl. Bangka, Malang	Dried banana
4	Banner Processing & HFG	Mojo Arum IV-7, Sby	Fruit jam and jelly
5	Batara Agung Muila	Kebraon II/21, Karang Pisang, Sby	Tomato and chili sauce
6	Bintang Mas	Pesarkembang 117, Sby	Tomato sauce
7	Cipta Rasa	Mojo HI/52, Sby	Tomato sauce
8	Darmo	Tanjungsari, Pacitan	Dried banana
9	Daya Semesta Food Ind.	Margorejo Indah XII/303, Sby	Canned pineapple
10	Delinus	Kedung Kandang, Mojokerto	Tomato sauce
11	Embasa Orima Food Indonesia	Rnugkut Industri 111/41, Sby	Tomato and chili sauce
12	Georges Limited	Ngagel Jaya Tengah IV/2, Sby	Fruit syrup
13	Hadi Sanjaya	Genteng Bandar I/II, Sby	Sirsak syrup
14	Harapan Jaya	Ngagik 70, Sby	Fruit syrup
15	Jaya Pineapple Canary	Plampitan Kalimin 27, Sby	Canned pineapple
16	Levis	Patemon 171, Sby	Tomato sauce
17	New Sumber Rasa	Kedung Cowek 167, Sby	Tomato and papaya sauce
18	PLY7 Mouth	Bengawan 57, Jatim	Pinapple, strawberry jam
19	Rimba Ria	Kedindin Tengah II/6, Jatim	Tomato and chili sauce
20	Roti Kering	Raya Mantup, Lamongan	Banana crispy
21	Sam Hop	Kembang Jepun, Jatim	Tomato and chili sauce
22	Sampurna	Cisdane 16, Sby	Fruit jam and jelly
23	Saritana	Keputran 22, Jatim	Manisan of Mango
24	Ny. Sukarti	Hadituwith, Pacitan	Dried banana
25	Sumber Alam	Klatak Giri, Banyuwangi	Dried banana
26	Sweet Nice	Taman Ngagel 19, Sby	Pineapple jelly and jam
27	ТВК	Ploso I/4a, Jatim	Manisan of Mango
28	Waru Sakti	Raya Dedungan, Sidiarjo	Canned papaya
29	Wen Ning	Lektol. Sumoharjo 76, Mojokerto	Grape juice
30	Horti Nusantara PT.	Mojokerto	Banana puree

### Table C-1-3 List of Agri-Business in East Java

Source: Dinas Pertanian Tanaman Pangan, Jawa Timur, Oct., 1997

No	Name	Address	Activity
l	Bintang Bola	JI. Korban 40, No.107, U. P.	Marquisa Syrup
2	CV. Karya Kita	Jl. Gunung Merapi 86, U. P.	ibid.
3	Sunny	JI. Sungai Pareman 21, U. P.	ibid.
4	Electra	JI. Sungai Tallo 15, U. P.	ibid.
5	Ratu	JI. Karunrung 5, U. P.	ibid.
6	Surya	JI. Satando 41, U. P.	ihid.
7	Prima	JI. Anuang, U. P.	ibid.
8	CV. Binang Malino	Jl. Yos Sudarso 153, U. P.	ibid.
9	PT. Marquisa Segar	Kanreapia, Kab. Gowa	ibid.
10	DHT	JI. Lembe 76, U. P.	ibid.
11	Torino	J1. Kesatuan 44, U. P.	ibid.
12	Dei Liang Seng	Jl. Karampete I, U. P.	ibid
13	Dunia Baru	JI. Nusantara 356, U. P.	ibid.
14	Safari	Jl. Bacan 98, U. P.	ibid.
15	Merpati Dua	II. UripSumoharjo 2/14, U. P.	ibid.
16	Sentosa	II. Abubakar Lambogo 255,	ibid.
17	Bintang Mas	Jł. Nusantara 358, U. P.	ibid.
18	Kuda Terbang	JI. Somba Opu 194/7, U. P.	ibid.
19	UD. Sulawesi Utama	JI. Nusantara 334, U. P.	ibid.
20	Agung Jaya	JI. Baronang 8, U. P.	ibid.
21	Setia	II. Kalimantan 136, U. P.	ibid.
22	Bulat Dunia	Jl. Haji Bora 5, U. P.	ibid.
23	Karunrung	JI. Gunung Latimojong 27,	ibid.
24	Marquisa 43	JI. KH Wahid Hasyim 43,	ibid.
25	Piala Dunia	Jl. Sungai Pareman 55/27	ibid.
26	Bola Dunia	Kanreapia, Kab. Gowa	ibid.
27	Toraja Marquisa	Makale, Kab. Tator	ibid.
28	Shantung	Makale, Kab. Tator	ibid.
29	UD. Cikoro	KEC. Tompobali, Kab. Gowa	ibid.
30	Spring	JI. Barawaja 3R/K, U. P.	ibid.

### Table C-1-4 List of Agri-business in South Suławesi

Source: DINas Pertanian Tanaman Pangan, Sulawesi Selatan; 1994