Appendix E--2

Observation Data of Water Use in the Selected Sample Farms.

Water Use Record of Production Farm (1/16)

° Name of Farm ; SAHAM (I)

° Area of Farm ; Af=3.51 ha
° Cropping Area ; Ac=2.46 ha
° Crops ; Dates, Mango Young Tree (2.16), Alf. (0.30)

° Cumulative Flow Meter
No. 2,543 → 2,536
- No - Pump(I)
° Type of Well, Handdug Well H=5.7m
° Type of Pump, Volute pump ø3"

Date	Reading		Water use		W.T	EC	Remarks
D.M.Y.	Pump I (cu.m)	Pump II (cu.m)	Volume (cu.m)	Depth V/Ac(mm)	(°C)	(µs/cm)	
13- 2-83	5	-	0		-	-	Mixed Farm
7- 3	1,377	-	1,372	56	28.0	1,500	
22- 3	2,455	-	2,450	100	29.2	1,449	
11- 4	3,606	-	3,601	146	24.1	1,238	
21- 4	4,294	-	4,289	174	24.8	1,395	
3- 5	5,162	-	5,157	210	25.5	1,392	
14- 5	6,162	-	6,157	250	28.3	1,450	
8- 6	8,120	-	8,115	330	29.1	1,490	
25- 6	9,839	-	9,834	400	34.4	1,320	
5- 7	10,750	-	10,745	437	30.7	1,396	
18- 7	11,704	-	11,699	476	30.8	1,409	
3- 8	13,501	-	13,496	549	32.6	1,433	
15- 8	14,276	-	14,271	580	34.3	1,538	
30- 8	15,642	-	15,637	636	28.9	1,317	
6- 9	16,205	-	16,200	659	29.7	1,437	
17-10	17,776	-	17,771	722	24.5	1,218	
1-11-83	"	-	"	"	30.2	1,364	
Meter change 2,543 → 2,536							
15-11-83	5	-	0	0	26.7	1,445	
20- 2-84	632 1/	-	627	25	19.0	-	
4- 3	"	-	"	"	18.8	1,149	
19- 3	"	-	"	"	21.9	1,136	
3- 4	"	-	"	"	30.0	1,299	
15- 4-84	"	-	"	"	30.1	-	
30- 4	"	-	"	"	30.5	1,320	
13- 5	-	-	-	-	24.6	1,132	
27- 5	-	-	-	-	30.2	1,190	
10- 6	-	-	-	-	30.1	1,320	
26- 6	-	-	-	-	29.4	1,348	
10- 7	-	-	-	-	30.3	1,180	
18- 7	634	-	629	26	"	1,200	
23- 7	1,212	-	1,207	49	30.4	"	
9- 8	2,671	-	2,666	108	29.1	1,265	

Note: 1/ Meter out of order

(continued)

Date D.M.Y.	Reading Pump I (cu.m)	Reading Pump II (cu.m)	Water use Volume (cu.m)	Water use Depth V/Ac(mm)	W.T (°C)	EC (µs/cm)	Remarks
11- 9-84	5,150	-	5,145	209	30.0	1,273	
23- 9	6,160	-	6,155	250	28.2	1,244	
8-10	7,201	-	7,196	293	24.8	1,167	
30-10	7,300	-	7,295	297	24.6	1,178	New Pump
13-11	10,190	0	10,185	414	23.6	-	t= 1 hrs/d q = 6 ℓ/s
12-12	11,885	626	12,506	508	29.2	1,198	"
30-12-84	12,648	1,015	13,658	555	27.3	1,270	"
14- 1-85	12,979	1,339	14,313	582	20.7	1,110	"
29- 1	13,542	1,663	15,200	618	20.3	1,113	"
11- 2	14,148	1,944	16,087	654	20.3	1,113	"
28- 2	14,628	2,311	16,934	688	29.2	1,492	"
11- 3	15,430	2,548	17,973	731	20.9	1,110	"
28- 3	16,445	2,915	19,355	787	24.7	1,187	"
9- 4	17,100	3,175	20,270	824	30.2	1,304	"
30- 4	17,690	3,628	21,313	866	23.5	1,180	"
13- 5	17,690	3,909	21,594	878	30.1	1,260	"
28- 5	17,690	4,233	21,918	891	28.3	1,240	"
10- 6	18,044	4,514	22,553	917	29.2	1,250	"
26- 6	18,690	4,859	23,544	957	-	-	"
17- 7	19,306	5,313	24,614	1,000	31.3	1,339	"
12- 8	21,045	5,875	26,915	1,094	30.5	1,260	

Water Use Record of Production Farm (2/16)

°Name of Farm ; SAHAM (II)
°Area of Farm ; Af=0.33 ha
°Cropping Area ; Ac=0.33 ha
°Crops ; Dates(0.33) Veg. &
Alf. (0.10) Double Croping

°Cumulative Flow Meter No. 2,547
° " No. -
°Type of Well, Handdug Well H=4.1m
°Type of Pump, Volute pump ϕ=3"

Date	Reading		Water use		W.T	EC	Remarks
	Pump I	Pump II	Volume	Depth			
D.M.Y.	(cu.m)	(cu.m)	(cu.m)	V/Ac(mm)	(°C)	(μs/cm)	
14- 2-83	10	-	0	0	-	-	Mixed Farm
7- 3	597	-	587	178	31.0	1,900	
22- 3	1,327	-	1,317	399	28.9	2,030	
11- 4	2,385	-	2,375	720	28.4	2,000	
21- 4	2,629	-	2,619	794	27.2	1,940	
2- 5	3,177	-	3,167	960	28.3	2,050	
14- 5	3,661	-	3,651	1,106	29.7	2,160	
8- 6	4,802	-	4,792	1,452	29.9	2,140	
25- 6	5,771	-	5,761	1,746	37.8	2,320	
5- 7	6,398	-	6,388	1,936	30.3	2,120	
18- 7	6,931	-	6,921	2,097	30.1	2,020	
3- 8	7,635	-	7,625	2,311	28.9	1,951	
15- 8	8,200	-	8,190	2,482	36.9	2,220	
30- 8	8,965	-	8,955	2,714	28.8	2,000	
6- 9	9,272	-	9,262	2,807	32.8	2,120	
9-10	10,640	-	10,630	3,221	26.6	1,855	
1-11	10,991	-	10,981	3,328	27.9	1,897	
15-11	11,208	-	11,198	3,393	24.9	1,767	
30-11	11,515	-	11,505	3,486	21.9	1,579	
14-12	11,732	-	11,722	3,552	20.8	1,573	
26-12-83	12,145	-	12,135	3,677	28.2	1,823	
11- 1-84	12,461	-	12,451	3,773	21.6	1,628	
25- 1	12,606	-	12,596	3,817	20.8	1,610	
7- 2	12,821	-	12,811	3,882	19.8	1,569	
20- 2-84	12,851	-	12,841	3,891	18.5	-	
4- 3	12,971	-	12,961	3,928	21.2	1,611	
19- 3	-	-	-	-	24.9	1,567	
2- 4	-	-	-	-	30.5	1,601	
15- 4	13,714	-	13,704	4,153	27.5	-	
30- 4	14,170	-	14,160	4,291	27.8	1,600	
13- 5	14,681	-	14,671	4,446	27.5	1,840	
27- 5	15,362	-	15,352	4,652	27.2	1,860	
11- 6	16,462	-	16,452	4,985	27.5	1,850	
26- 6	17,319	-	17,309	5,245	29.2	2,040	
10- 7	18,093	-	18,083	5,480	31.4	2,110	
23- 7	19,095	-	19,085	5,783	31.8	2,120	
9- 8	20,409	-	20,399	6,182	29.1	2,140	
26- 8	21,602	-	21,592	6,543	32.4	2,230	

(continuing)

(continued)

Date D.M.Y.	Reading Pump I (cu.m)	Reading Pump II (cu.m)	Water use Volume (cu.m)	Water use Depth V/Ac(mm)	W.T (°C)	EC (µs/cm)	Remarks
11- 9-84	22,665	-	22,655	6,865	29.8	2,160	
23- 9	23,375	-	23,365	7,080	28.4	2,160	
8-10	24,018	-	24,008	7,275	26.4	1,990	
30-10	25,119	-	25,109	7,609	25.9	2,010	
11-11	25,142	-	25,132	7,616	25.6	1,974	
12-12	27,065	-	27,055	8,198	25.8	1,988	
12-30-84	27,708	-	27,698	8,393	22.8	1,776	
14- 1	28,426	-	28,416	8,611	28.6	2,090	
29- 1	28,921	-	28,911	8,761	23.2	1,960	
11- 2	29,093	-	29,083	8,813	22.7	1,958	
26- 2	29,822	-	29,812	9,034	23.8	1,930	
11- 3	30,142	-	30,132	9,131	-	-	
28- 3	30,973	-	30,963	9,383	26.2	2,000	
9- 4	31,450	-	31,440	9,527	28.7	2,070	
30- 4	32,317	-	32,307	9,790	25.9	2,000	
13- 5	32,907	-	32,897	9,969	28.8	2,050	
28- 5	34,123	-	34,113	10,337	28.6	2,070	
10- 6	34,646	-	34,636	10,496	29.3	2,180	
27- 6	35,128	-	35,118	10,642	29.2	2,170	
17- 7	35,949	-	35,939	10,891	30.3	2,160	
12- 8-85	35,949	-	35,939	10,891	30.9	2,360	

Water Use Record of Production Farm (3/16)

°Name of Farm ; SUWAIQ (I)
°Area of Farm ; Af=4,43 ha
°Cropping Area ; Ac=4.11 ha
°Crops ; Veg.(1.71), Alf.(1.20)
Dates, Lime Young Tree (1.20)

°Cumulative Flow Meter No. 2,537
° " No. -
°Type of Well, Handdug Well H=13.4 m
°Type of Pump, Volute pump ϕ=3"x1 unit

Date	Reading		Water use		W.T	EC	Remarks
	Pump I	Pump II	Volume	Depth			
D.M.Y.	(cu.m)	(cu.m)	(cu.m)	V/Ac(mm)	(°C)	(µs/cm)	
2- 2-83	3	-	0		-	-	Mixed Farm
17- 2	1,716		1,713	42	30.9	857	
1- 3	4,058	-	4,055	99	31.0	839	
10- 3	6,081	-	6,078	148	30.2	851	
21- 3	8,648	-	8,645	210	30.0	829	
10- 4	12,707	-	12,704	309	30.9	853	
20- 4	14,643	-	14,640	356	31.1	835	
1- 5	17,393	-	17,390	423	31.2	835	
12- 5	20,202	-	20,199	491	31.2	838	
6- 6	26,593	-	26,590	647	31.4	830	
20- 6	30,130	-	30,127	733	31.3	812	
4- 7	33,577	-	33,574	817	31.3	801	
17- 7	36,543	-	36,540	889	31.3	808	
2- 8	40,738	-	40,735	991	31.8	808	
14- 8	43,723	-	43,720	1,064	31.3	806	
28- 8	46,620	-	46,617	1,134	31.3	803	
5- 9	48,454	-	48,451	1,179	31.3	803	
16-10	57,164	-	57,161	1,391	31.3	795	
30-10	60,190	-	60,187	1,464	31.2	785	
14-11	63,165	-	63,162	1,537	31.2	790	
29-11	66,047	-	66,044	1,607	31.1	790	
12-12	68,640	-	68,637	1,670	31.2	799	
25-12-83	71,254	-	71,251	1,734	31.1	808	
10- 1-84	74,552	-	74,549	1,814	31.1	798	
24- 1-84	77,593	-	77,590	1,888	31.1	792	
6- 2	80,335	-	80,332	1,955	31.1	782	
19- 2	83,128	-	83,125	2,023	30.9	792	
3- 3	85,669	-	85,666	2,084	31.1	719	
12- 3	88,744	-	88,741	2,159	31.2	794	
1- 4	92,190	-	92,187	2,243	31.3	796	
14- 4	95,240	-	95,237	2,317	31.3	-	
29- 4	98,924	-	98,921	2,407	31.3	770	
13- 5	101,878	-	101,875	2,479	27.6	740	
26- 3	104,939	-	104,936	2,553	31.4	770	
10- 6	108,596	-	108,593	2,642	31.4	770	
24- 6	111,905	-	111,902	2,723	31.4	786	
10- 7	115,599	-	115,596	2,813	31.6	780	
23- 7	117,379	-	117,376	2,856	31.4	770	
7- 8	119,022	-	119,019	2,896	30.1	740	
26- 8	122,389	-	122,386	2,978	31.5	760	

(continuing)

(continued)

Date D.M.Y.	Reading Pump I (cu.m)	Reading Pump II (cu.m)	Water use Volume (cu.m)	Water use Depth V/Ac(mm)	W.T (°C)	EC (µs/cm)	Remarks
11- 9-84	124,630	-	124,627	3,032	31.3	818	
23- 9	126,193	-	126,190	3,070	31.4	777	
8-10	128,980	-	128,977	3,138	31.3	756	
30-10	133,198	-	133,195	3,241	31.3	746	
10-11	135,234	-	135,231	3,290	31.3	756	
12-12	141,491	-	141,488	3,443	31.3	755	
29-12-84	143,987	-	143,984	3,503	31.1	650	
13- 1-85	145,935	-	145,932	3,551	31.3	740	
13- 2	148,176	-	148,173	3,605	31.3	763	
24- 2	152,770	-	152,767	3,717	31.2	761	
10- 3	155,226	-	155,223	3,777	31.3	740	
27- 3	157,879	-	157,876	3,841	30.8	778	
9- 4	159,831	-	159,828	3,889	31.2	749	
30- 4	164,121	-	164,118	3,993	31.3	747	
12- 5	166,783	-	166,780	4,058	31.4	755	
26- 5	169,717	-	169,714	4,129	31.4	750	
8- 6	172,503	-	172,500	4,197	31.5	738	
26- 6	176,019	-	176,016	4,283	31.6	738	
8- 7	178,582	-	178,579	4,345	31.6	730	
11- 8-85	194,949	-	194,946	4,743	31.5	760	

Water Use Record of Production Farm (4/16)

°Name of Farm : SUWAIQ (II)
°Area of Farm ; Af=3.00 ha
°Cropping Area ; Ac=2.90 ha
°Crops ; Dates(2.80), Alf.(0.10)

°Cumulative Flow Meter No. 2,548 (I)
° " No. 2,535 (II)
°Type of Well, Handdug Well L=11.3m, 11.2m
°Type of Pump, Volute pump ϕ=3"x2 units

Date D.M.Y.	Reading Pump I (cu.m)	Reading Pump II (cu.m)	Water use Volume (cu.m)	Water use Depth V/Ac(mm)	W.T (°C)	EC (μs/cm)	Remarks
					-	-	Dates palm
5- 2-83	4	8	0	0	-	-	Farm
					23.9	1,560(I)	
17- 2	307	55	350	12	-	- (II)	
					30.3	1,772	
1- 3	514	346	848	29	21.2	1,116	
					30.5	1,733	
10- 3	711	408	1,107	38	27.5	1,275	
					30.7	1,816	
21- 3	884	643	1,515	52	27.6	1,275	
					25.8	1,620	
10- 4	1,156	987	2,131	73	25.0	1,267	
					30.8	1,775	
20- 4	1,309	1,150	2,447	84	25.5	1,259	
					31.3	1,750	
1- 5	2,283	1,524	3,795	131	31.6	1,471	
					29.6	1,776	
12- 5	2,623	1,922	4,533	156	28.8	1,363	
					31.8	1,747	
6- 6	3,686	2,837	6,521	225	32.5	1,527	
					31.9	1,701	
20- 6	4,040	3,466	7,494	258	30.8	1,351	
					31.6	1,740	
4- 7	4,955	3,972	8,915	307	31.3	1,394	
					30.9	1,707	
17- 7	5,669	4,386	10,043	346	29.8	1,368	
					30.2	1,640	
2- 8	6,190	4,610	10,788	372	29.1	1,340	
					31.4	1,739	
14- 8	6,400	4,728	11,116	383	34.0	1,591	
					32.8	1,680	
28- 8	6,904	4,952	11,844	408	35.4	1,482	
					31.6	1,680	
5- 9	7,091	5,197	12,276	423	31.8	1,390	

(continuing)

(continued)

Date D.M.Y.	Reading Pump I (cu.m)	Reading Pump II (cu.m)	Water use Volume (cu.m)	Water use Depth V/Ac (mm)	W.T (°C)	EC (µs/cm)	Remarks
					27.0	1,592(I)	
16-10	8,970	6,313	15,271	527	24.8	1,251(II)	
					25.1	1,535	
30-10	9,486	6,820	16,294	562	22.9	1,203	
					26.2	1,491	
14-11	10,127	7,176	17,291	596	22.9	1,252	
					25.2	1,484	
29-11	10,658	7,615	18,261	630	21.2	1,194	
					23.4	1,410	
12-12	11,124	7,950	19,062	657	24.0	1,180	
					23.6	1,410	
25-12-83	11,450	8,250	19,688	679	22.3	1,178	
					21.0	1,334	
10- 1-84	11,792	8,564	20,344	702	21.7	1,136	
					23.1	1,377	
24- 1-84	12,120	8,818	20,926	722	17.7	1,078	
					21.0	1,329	
6- 2	12,297	8,987	21,272	734	21.2	1,158	
					31.1	1,624	
19- 2	12,802	9,231	22,021	759	18.6	1,111	
					24.7	1,475	
3- 3	13,421	9,446	22,855	788	21.6	1,136	
					27.9	1,570	
17- 3	13,819	9,630	23,437	808	25.8	1,220	
					31.3	1,651	
1- 4	14,442	9,983	24,413	842	26.3	1,263	
					29.6	-	
14- 4	14,895	10,340	25,223	870	30.0	-	
					28.8	1,600	
29- 4	15,679	10,835	26,502	914	28.7	1,210	
					28.6	1,580	
13- 5	16,435	11,166	27,589	951	27.1	1,210	
					31.8	1,730	
26- 5	16,879	11,515	28,382	979	31.3	1,310	
					30.2	1,680	
10- 6	17,559	11,880	29,427	1,015	29.7	1,260	
					30.4	1,778	
24- 6	18,136	12,255	30,379	1,048	29.0	1,336	
					33.6	1,740	
10- 7	18,688	12,431	31,107	1,073	33.4	1,400	
					30.8	1,710	
23- 7	18,862	12,485	31,335	1,081	29.7	1,410	
					31.4	1,690	
7- 8	19,328	12,561	31,877	1,099	31.8	1,360	
					31.7	1,750	
26- 8	20,274	13,113	33,375	1,151	33.0	1,350	

(continued)

Date	Reading		Water use		W.T	EC	Remarks
	Pump I	Pump II	Volume	Depth			
D.M.Y.	(cu.m)	(cu.m)	(cu.m)	V/Ac (mm)	(°C)	(µs/cm)	
					27.0	1,592(I)	
16-10	8,970	6,313	15,271	527	24.8	1,251(II)	
					25.1	1,535	
30-10	9,486	6,820	16,294	562	22.9	1,203	
					26.2	1,491	
14-11	10,127	7,176	17,291	596	22.9	1,252	
					25.2	1,484	
29-11	10,658	7,615	18,261	630	21.2	1,194	
					23.4	1,410	
12-12	11,124	7,950	19,062	657	24.0	1,180	
					23.6	1,410	
25-12-83	11,450	8,250	19,688	679	22.3	1,178	
					21.0	1,334	
10- 1-84	11,792	8,564	20,344	702	21.7	1,136	
					23.1	1,377	
24- 1-84	12,120	8,818	20,926	722	17.7	1,078	
					21.0	1,329	
6- 2	12,297	8,987	21,272	734	21.2	1,158	
					31.1	1,624	
19- 2	12,802	9,231	22,021	759	18.6	1,111	
					24.7	1,475	
3- 3	13,421	9,446	22,855	788	21.6	1,136	
					27.9	1,570	
17- 3	13,819	9,630	23,437	808	25.8	1,220	
					31.3	1,651	
1- 4	14,442	9,983	24,413	842	26.3	1,263	
					29.6	-	
14- 4	14,895	10,340	25,223	870	30.0	-	
					28.8	1,600	
29- 4	15,679	10,835	26,502	914	28.7	1,210	
					28.6	1,580	
13- 5	16,435	11,166	27,589	951	27.1	1,210	
					31.8	1,730	
26- 5	16,879	11,515	28,382	979	31.3	1,310	
					30.2	1,680	
10- 6	17,559	11,880	29,427	1,015	29.7	1,260	
					30.4	1,778	
24- 6	18,136	12,255	30,379	1,048	29.0	1,336	
					33.6	1,740	
10- 7	18,688	12,431	31,107	1,073	33.4	1,400	
					30.8	1,710	
23- 7	18,862	12,485	31,335	1,081	29.7	1,410	
					31.4	1,690	
7- 8	19,328	12,561	31,877	1,099	31.8	1,360	
					31.7	1,750	
26- 8	20,274	13,113	33,375	1,151	33.0	1,350	

(continued)

Date	Reading		Water use		W.T	EC	Remarks
	Pump I	Pump II	Volume	Depth			
D.M.Y.	(cu.m)	(cu.m)	(cu.m)	V/Ac(mm)	(°C)	(µs/cm)	
					29.8	1,795(I)	
11- 9-84	20,915	13,607	34,510	1,190	31.1	1,365(II)	
					29.9	1,781	
23- 9	21,315	14,206	35,509	1,224	29.1	1,329	
					26.9	1,678	
8-10	21,853	14,701	36,542	1,260	22.9	1,238	
					25.7	1,689	
30-10	22,334	15,085	37,407	1,290	21.7	1,191	
					25.9	1,779	
10-11	22,664	15,283	37,935	1,308	25.0	1,268	
					23.3	1,687	
12-12	23,250	15,691	38,929	1,342	25.2	1,383	
					25.1	1,850	
29-12-84	23,507	15,879	39,374	1,358	22.5	1,222	
					24.7	1,750	
13- 1-85	23,656	15,933	39,577	1,365	20.4	1,160	
					24.7	1,834	
28- 1	23,906	-	-	-	-	-	
					24.7	1,834	
11- 2	23,912	16,191	40,091	1,382	19.9	1,191	
					24.2	1,865	
24- 2	24,548	16,556	41,092	1,417	21.5	1,186	
					24.0	1,830	
10- 3	24,783	16,705	41,476	1,430	21.0	1,200	
					26.9	1,944	
27- 3	25,301	16,957	42,246	1,457	31.1	1,507	
					25.5	1,896	
9- 4	25,631	17,242	42,861	1,478	-	-	
					26.9	1,989	
30- 4	26,389	17,805	44,182	1,524	24.7	1,384	
					28.5	2,050	
12- 5	26,863	18,219	45,070	1,554	27.5	1,455	
					29.3	2,110	
26- 5	27,442	18,713	46,143	1,591	31.1	1,510	
					29.7	2,160	
8- 6	28,062	19,304	47,354	1,633	31.4	1,500	
					31.3	2,240	
26- 6	28,686	19,906	48,580	1,675	31.5	1,520	
					30.7	2,220	
8- 7	29,133	20,198	49,319	1,701	30.0	1,540	
					31.2	2,290	
11- 8-85	29,833	20,383	50,204	1,731	31.7	1,633	

Water Use Record of Production Farm (5/16)

°Name of Farm ; MAMFESH
°Area of Farm ; Af=2.80 ha
°Cropping Area ; Ac=1.90 ha
°Crops ; Dates, Lime(1.00)
Alf.(0.90)

°Cumulative Flow Meter No. 2,546 (Pump I)
° " No. -no- (Pump II)
°Type of Well, Handdug Well H=7.8 m
°Type of Pump, Volute pump ϕ=3"x2 units

Date	Reading		Water use		W.T	EC	Remarks
	Pump I	Pump II	Volume	Depth			
D.M.Y.	(cu.m)	(cu.m)	(cu.m)	V/Ac(mm)	(°C)	(μs/cm)	
15- 2-83	4	-	0	0	24.8	1,641	Mixed Farm
1- 3	1,736	-	1,732	91	31.8	1,850	
10- 3	3,185	-	3,181	167	30.7	1,889	
21- 3	5,301	-	5,297	279	30.3	1,884	
10- 4	6,682	-	6,678	351	24.5	1,700	
20- 4	6,682	-	6,678	351	23.5	2,310	
1- 5	7,691	-	7,687	405	27.6	2,180	
6- 6	12,637	-	12,633	665	30.1	2,010	
20- 6	14,910	-	14,906	785	30.1	1,987	
4- 7	17,272	-	17,268	909	30.1	1,976	
17- 7	20,413	-	20,409	1,074	30.3	1,969	
2- 8	23,484	-	23,480	1,236	30.3	1,880	
14- 8	26,133	-	26,129	1,375	30.4	1,958	
23- 8	27,386	-	27,382	1,441	30.4	1,952	
4- 9	27,386	-	27,382	1,441	32.5	1,930	

The data quoted below herein cannot be analyzed due to the following reasons.

1. Pump malfunction has occurred frequently.
2. The lifting capacity of pump units added is not clarified.

Water Use Record of Production Farm (6/16)

°Name of Farm ; MUSANA'AH (I)
°Area of Farm ; Af=0.46 ha
°Cropping Area ; Ac=0.46 ha
°Crops ; Date palm(0.46)

°Cumulative Flow Meter No. 2,538
° " No. -
°Type of Well, Handdug Well L=11.9 m
°Type of Pump, Volute pump φ=3"

Date	Reading		Water use		W.T	EC	Remarks
	Pump I	Pump II	Volume	Depth			
D.M.Y.	(cu.m)	(cu.m)	(cu.m)	V/Ac(mm)	(°C)	(μs/cm)	
1- 2-83	4	-	0		-	-	Dates palm Farm near police station
17- 2	191	-	187	41	22.1	11,360	
1- 3	430	-	426	93	18.8	10,740	
10- 3	638	-	634	138	30.0	13,070	
21- 3	773	-	769	167	29.9	13,030	
9- 4	984	-	980	213	25.6	11,960	
19- 4	1,090	-	1,086	236	30.0	12,900	
30- 4	1,217	-	1,213	264	25.1	12,200	
11- 5	1,397	-	1,393	303	30.2	12,900	
21- 5	1,544	-	1,540	335	27.9	12,870	
5- 6	1,779	-	1,775	386	30.6	13,210	
18- 6	2,082	-	2,078	452	30.8	13,230	
3- 7	2,612	-	2,608	567	32.6	13,670	
16- 7	2,875	-	2,871	624	30.0	13,140	
2- 8	3,160	-	3,156	686	28.8	13,100	
14- 8	3,422	-	3,418	743	29.6	13,500	
27- 8	3,760	-	3,756	817	31.7	-	
4- 9	3,814	-	3,810	828	31.7	-	
15-10	4,479	-	4,475	973	24.6	-	
29-10	4,740	-	4,736	1,030	21.5	-	
13-11	4,862	-	4,858	1,056	22.3	-	
28-11	4,862	-	4,858	1,056	20.7	-	
11-12	4,862	-	4,858	1,056	-	-	
25-12-83	4,862	-	4,858	1,056	-	-	
10- 1-84	-	-	-	-	-	-	
24- 1	-	-	-	-	-	-	
6- 2	5,009	-	5,005	1,088	17.0	11,150	
19- 2	5,185	-	5,181	1,126	17.6	10,710	
3- 3	5,201	-	5,197	1,130	20.1	11,290	
17- 3	5,358	-	5,354	1,164	24.8	12,380	
1- 4	5,468	-	5,464	1,188	23.9	12,140	
14- 4	5,559	-	5,555	1,208	24.9	-	
29- 4	5,698	-	5,694	1,238	24.5	11,970	
12- 5	5,698	-	5,694	1,238	28.4	-	
25- 5	5,786	-	5,782	1,257	37.8	12,790	
9- 6	6,286	-	6,282	1,366	28.8	13,230	
23- 6	6,751	-	6,747	1,467	29.8	13,400	

(continuing)

(continued)

Date D.M.Y.	Reading Pump I (cu.m)	Reading Pump II (cu.m)	Water use Volume (cu.m)	Water use Depth V/Ac(mm)	W.T (°C)	EC (µs/cm)	Remarks
9- 7	7,051	-	7,047	1,532	32.1	14,830	
23- 7	7,324	-	7,320	1,591	30.1	13,800	
7- 8	7,783	-	7,779	1,691	29.3	13,490	
26- 8	7,911	-	7,907	1,719	30.1	14,630	
10- 9-84	7,914	-	7,910	1,720	30.3	EL>20,000	
22- 9	7,915	-	7,911	1,720	-	-	
7-10	7,932*1	-	7,928	1,723	23.6	12,310	*1 Meter taken out
29-10	7,932*1	-	7,928	1,723	22.9	12,420	
10-11	7,932	-			-	-	
26-11	7,932	-	-	-	-	-	
11-12	7,932	-	-	-	-	-	
26-12-84	7,932	-	-	-	-	-	
13- 1-85	7,932	-	-	-	-	-	
10- 2	7,932	-	-	-	-	-	
24- 2	7,932	-	-	-	-	-	
10- 3	7,932	-	-	-	-	-	
27- 3	7,932	-	-	-	-	-	
22- 4	7,932	-	-	-	-	-	
12- 5	7,932	-	-	-	-	-	
26- 6	7,932	-	-	-	-	-	
8- 7	7,932	-	-	-	27.6	14,000	
15- 7	7,932*2	-	0	0	-	-	
23- 7	8,194	-	262	57	30.3	13,740	*2 Meter is installed again
11- 8	8,696	-	764	166	29.2	13,840	
31- 8	9,160	-	1,228	267	30.2	14,540	

Water Use Record of Production Farm (7/16)

°Name of Farm ; MUSANA'AH (II)
°Area of Farm ; Af=2.96 ha
°Cropping Area ; Ac=2.96 ha
°Crops ; Dates, Lime(1.55)
Alf.(0.95)
Veg.(0.46)

°Cumulative Flow Meter No. 2,519 pump(I)
° " No. -no- pump(II)
°Type of Well, Handdug Well L=12.1 m
°Type of Pump, Volute pump ϕ=3"x2 units

Date	Reading		Water use		W.T	EC	Remarks
	Pump I	Pump II	Volume	Depth			
D.M.Y.	(cu.m)	(cu.m)	(cu.m)	V/Ac(mm)	(°C)	(μs/cm)	
1- 2-83	4	0	0		-	-	Mixed Farm
17- 2	1,587	0	1,583	53	30.2	3,060	
1- 3	2,935	0	2,931	99	29.0	3,100	
10- 3	4,250	0	4,246	143	30.2	3,070	
21- 3	5,649	0	5,645	191	30.3	3,090	
9- 4	6,726	0	6,722	227	30.9	3,110	
19- 4	6,726	1,080	7,802	264	30.0	3,080	Pump II 5hr operation
30- 4	7,217	2,268	9,478	320	30.3	3,080	"
11- 5	7,814	4,320	12,130	410	30.5	3,150	"
21- 5	8,213	5,400	13,609	460	30.4	3,040	"
5- 6	8,870	7,020	15,886	537	31.1	3,090	"
18- 6	9,449	8,424	17,869	604	30.5	2,980	"
3- 7	10,304	10,044	20,344	687	30.5	2,870	"
16- 7	10,775	11,448	22,219	751	30.4	2,900	"
2- 8	11,547	13,284	24,827	839	30.3	2,890	"
14- 8	12,626	13,284	25,906	875	29.9	2,900	
27- 8	14,078	13,284	27,358	924	31.7	3,000	
4- 9	14,720	13,284	28,000	946	30.4	2,930	
15-10	16,656	13,284	29,936	1,011	30.1	3,080	
29-10	16,656	14,796	31,448	1,062	30.3	2,960	Pump II 5hr operation
13-11	16,656	16,416	33,068	1,117	29.7	2,900	"
28-11	16,656	18,036	34,688	1,172	29.7	2,960	"
11-12	17,817	19,440	37,253	1,203	30.2	2,980	"
25-12-83	18,511	19,440	37,947	1,282	22.1	2,560	"

(continuing)

Note: The pump (I) shall be operated for 3.5hrs. in the evening (15:00-18:30), while the pump (II) for 5.0hrs. in the morning (7:00-12:00). Therefore, the daily lifting capacity (V) of the pump (II) is estimated with the capacity of q=6 ℓ/s and operation hours of t=5.0hrs. in using the equation by V=q x t.

(continued)

Date D.M.Y.	Reading Pump I (cu.m)	Reading Pump II (cu.m)	Water use Volume (cu.m)	Water use Depth V/Ac(mm)	W.T (°C)	EC (μs/cm)	Remarks
10- 1-84	19,633	19,440	39,069	1,320	21.1	2,620	
24- 1	19,633	20,952	40,581	1,371	30.2	3,000	Pump II 5hr operation
6- 2	19,633	22,356	41,985	1,418	30.3	3,040	"
19- 2	19,633	24,192	43,821	1,480	21.2	2,630	"
3- 3	19,865	25,488	45,349	1,532	30.2	2,920	"
17- 3	19,904	27,000	46,900	1,584	26.5	2,920	"
1- 4	20,054	28,620	48,670	1,644	30.2	3,130	"
14- 4	20,054	30,024	50,074	1,692	30.4	-	"
29- 4	20,278	31,644	51,918	1,754	30.3	3,080	"
12- 5	21,334	33,048	54,378	1,837	30.4	3,010	"
26- 5	22,260	34,560	56,816	1,919	30.4	3,030	"
9- 6	23,019	36,072	59,087	1,996	30.4	3,020	"
23- 6	23,482	37,584	61,062	2,063	30.4	2,990	"
9- 7	24,183	39,312	63,491	2,145	30.5	3,050	"
23- 7	24,820	40,824	65,640	2,218	-	-	"
7- 8	24,948	42,444	67,388	2,277	29.8	2,980	"
26- 8	25,209	44,496	69,701	2,355	30.5	3,000	"
10- 9-84	25,410	45,792	71,198	2,405	30.5	3,000	Pump II 4hrs operation
22- 9	25,945	46,828	72,696	2,458	30.2	3,040	"
7-10	26,143	48,124	74,263	2,509	30.3	3,030	"
10-11	26,143	51,062	77,201	2,608	30.3	3,080	"
26-11	26,428	52,444	78,868	2,664	30.3	3,040	"
11-12	26,481	53,740	80,217	2,710	25.7	2,830	"
26-12-84	26,481	55,036	81,513	2,754	29.2	3,170	"
13- 1-85	26,481	56,678	83,155	2,809	23.1	2,670	"
27- 1	26,481	57,888	84,365	2,850	24.7	2,790	"
10- 2	26,481	59,097	85,574	2,891	22.7	2,800	"
24- 2	26,550	60,307	86,853	2,934	22.3	2,700	"
10- 3	26,550	61,516	88,062	2,975	30.2	3,080	"
27- 3	26,881	62,899	89,776	3,033	30.3	3,080	"
8- 4	26,978	63,849	90,823	3,068	30.4	3,020	"
22- 4	27,543	65,059	92,598	3,128	30.3	3,120	"
12- 5	28,917	66,787	95,700	3,233	27.6	2,930	"
26- 5	29,907	67,996	97,899	3,307	28.2	3,050	"
8- 6	30,911	69,119	100,026	3,379	30.2	3,080	"
26- 6	32,631	70,674	103,301	3,490	30.4	3,080	"
8- 7	33,346	71,711	105,053	3,549	30.5	3,100	"
23- 7	34,399	73,007	107,402	3,628	30.6	3,090	"
11- 8	35,175	74,648	109,819	3,710	30.5	3,140	"

Water Use Record of Production Farm (8/16)

°Name of Farm ; MUSANA'AH (III)
°Area of Farm ; Af=2.75 ha
°Cropping Area ; Ac=1.30 ha
°Crops ; Dates, Lime Young Tree (0.90), Alf.(0.40)

°Cumulative Flow Meter No. 2,539
° " No. -
°Type of Well, Handdug Well H=16.3m
°Type of Pump, Volute pump ϕ=3"x1 unit

Date	Reading		Water use		W.T	EC	Remarks
	Pump I	Pump II	Volume	Depth			
D.M.Y.	(cu.m)	(cu.m)	(cu.m)	V/Ac(mm)	(°C)	(μs/cm)	
10- 3-83	29	-	0	0	31.2	1,272	New Farm near Tarif
21- 3	876	-	847	65	31.2	1,277	
9- 4	1,622	-	1,593	123	28.6	1,186	
19- 4	2,237	-	2,208	170	29.5	1,272	
30- 4	2,383	-	2,354	181	31.3	1,294	
11- 5	2,394	-	2,365	182	30.9	1,290	
21- 5	-	-	2,365	182	-	-	No Pump
5- 6	-	-	2,365	182	-	-	"
18- 6	2,905	-	2,876	221	31.4	1,225	
3- 7	4,114	-	4,085	314	32.8	1,263	
16- 7	4,922	-	4,893	376	32.5	1,237	
2- 8	5,758	-	5,729	441	31.2	1,200	
14- 8	6,525	-	6,496	500	31.4	1,208	
27- 8	7,477	-	7,448	572	32.0	1,227	
4- 9	7,988	-	7,959	612	32.1	1,200	
15-10	10,356	-	10,330	795	31.3	1,231	
29-10	11,220	-	11,191	861	24.9	1,040	
13-11	12,050	-	12,021	925	31.2	1,150	
28-11	12,928	-	12,899	992	31.2	1,177	
11-12	13,374	-	13,345	1,027	31.3	1,150	
25-12-83	14,654	-	14,625	1,125	30.0	1,158	
10- 1-84	15,772	-	15,743	1,211	31.1	1,162	
24- 1	16,368	-	16,339	1,257	30.7	1,149	
6- 2	17,087	-	17,058	1,312	29.7	1,146	
19- 2-84	17,795	-	17,766	1,367	30.9	1,151	
3- 3	18,534	-	18,505	1,423	29.8	1,129	
17- 3	19,216	-	19,187	1,476	31.2	1,181	
1- 4	20,258	-	20,229	1,556	31.3	1,188	
14- 4	21,302	-	21,273	1,636	31.4	-	
29- 4	22,608	-	22,579	1,737	31.0	1,220	
12- 5	23,742	-	23,713	1,824	31.7	1,260	
26- 5	25,182	-	25,153	1,943	31.1	1,150	

(continuing)

(continued)

Date D.M.Y.	Reading Pump I (cu.m)	Reading Pump II (cu.m)	Water use Volume (cu.m)	Water use Depth V/Ac (mm)	W.T (°C)	EC (µs/cm)	Remarks
9- 6	26,704	-	26,675	2,052	31.4	1,330	
23- 6	27,689	-	27,660	2,128	31.6	1,360	
9- 7	28,977	-	28,948	2,227	33.1	1,430	
22- 7	28,978	-	28,949	2,227	28.5	1,350	
7- 8	30,131	-	30,102	2,316	31.6	1,370	
26- 8	31,741	-	31,712	2,439	31.7	1,370	
10- 9-84	32,624	-	32,595	2,507	31.5	1,340	
22- 9	33,896	-	33,867	2,605	31.1	1,380	
7-10	35,264	-	35,235	2,710	31.5	1,340	
29-10	36,341	-	36,312	2,793	31.0	1,360	
10-11	37,641	-	37,612	2,893	31.4	1,360	
26-11	38,485	-	38,456	2,958	30.6	1,372	
11-12	39,696	-	39,667	3,051	31.2	1,343	
26-12-84	40,802	-	40,773	3,136	31.2	1,344	
13- 1-85	41,506	-	41,477	3,191	23.7	1,187	
27- 1	42,213	-	42,184	3,245	24.3	1,187	
10- 2	42,218	-	42,189	3,245	24.2	1,186	
24- 2	43,846	-	43,817	3,371	30.2	1,377	
10- 3	44,820	-	44,791	3,445	31.2	1,301	
27- 3	46,177	-	46,148	3,550	31.4	1,350	
8- 4	47,245	-	47,216	3,632	31.0	1,321	
22- 4	48,536	-	48,507	3,731	31.5	1,340	
12- 5	50,397	-	50,368	3,874	30.9	1,360	
26- 5	51,867	-	51,838	3,988	31.5	1,369	
8- 6	53,521	-	53,492	4,115	31.6	1,329	
26- 6	55,191	-	55,162	4,243	31.8	1,300	
8- 7	56,295	-	56,266	4,328	31.7	1,290	
23- 7	57,972	-	57,943	4,457	31.7	1,260	
11- 8	59,941	-	59,912	4,609	30.9	1,320	

Water Use Record of Production Farm(9/16)

°Name of Farm ; MULADDAH
°Area of Farm ; Af=1.61 ha
°Cropping Area ; Ac=1.61 ha
°Crops ; Dates(1.32ha),
Alf.(0.29)

°Cumulative Flow Meter No. 2,534
° " No. -
°Type of Well, Handdug Well H=11.3 m
°Type of Pump, Volute pump φ=3"x1 unit

Date D.M.Y.	Reading Pump I (cu.m)	Reading Pump II (cu.m)	Water use Volume (cu.m)	Water use Depth V/Ac(mm)	W.T (°C)	EC (μs/cm)	Remarks
10- 3-83	4	-	0	0	24.5	2,150	Mixed Farm
21- 3	667	-	663	41	31.7	2,420	
9- 4	2,370	-	2,366	147	30.1	2,350	
19- 4	3,012	-	3,008	187	31.2	2,480	
30- 4	4,452	-	4,518	282	31.1	2,280	
11- 5	6,045	-	6,041	375	31.3	2,600	
21- 5	7,646	-	7,642	475	31.0	2,400	
6- 6	10,173	-	10,169	632	31.3	2,380	
20- 6	12,320	-	12,316	765	31.3	2,350	
4- 7	14,501	-	14,497	900	31.3	2,350	
16- 7	15,996	-	15,992	993	31.8	2,340	
2- 8	18,245	-	18,241	1,133	30.3	2,360	
14- 8	19,556	-	19,552	1,214	31.6	2,380	
27- 8	21,496	-	21,492	1,345	31.4	2,370	
4- 9	22,903	-	22,899	1,422	31.4	2,371	
15-10	28,351	-	28,347	1,761	31.4	2,410	
29-10	29,984	-	29,980	1,862	31.3	2,340	
13-11	31,865	-	31,861	1,979	31.3	2,320	
28-11	33,608	-	33,604	2,087	30.2	2,300	
11-12	34,298	-	34,294	2,130	22.6	2,110	
25-12-83	34,428	-	34,424	2,138	29.3	2,260	
10- 1-84	36,053	-	36,049	2,239	30.7	2,330	
24- 1	37,669	-	37,665	2,339	31.0	2,300	
6- 2	39,026	-	39,022	2,424	31.3	2,290	
19- 2-84	40,494	-	40,490	2,515	31.0	2,280	
3- 3	41,826	-	41,822	2,598	31.0	2,280	
17- 3	43,682	-	43,678	2,713	31.1	2,290	
1- 4	45,541	-	45,537	2,828	31.2	2,280	
14- 4	47,301	-	47,297	2,938	31.2	-	
29- 4	49,600	-	49,596	3,080	31.1	2,270	
12- 5	50,803	-	50,799	3,155	31.2	2,290	
26- 5	52,616	-	52,612	3,268	31.2	2,260	
9- 6	54,742	-	54,738	3,400	31.2	2,320	
23- 6	56,899	-	56,895	3,534	31.2	2,310	

(continuing)

(continued)

Date	Reading		Water use		W.T	EC	Remarks
	Pump I	Pump II	Volume	Depth			
D.M.Y.	(cu.m)	(cu.m)	(cu.m)	V/Ac(mm)	(°C)	(μs/cm)	
9- 7	58,897	-	58,893	3,658	31.2	2,350	
23- 7	60,694	-	60,690	3,770	31.5	2,360	
7- 8	62,744	-	62,740	3,897	31.3	2,340	
26- 8	65,882	-	65,878	4,092	31.7	2,340	
10- 9-84	68,146	-	68,142	4,232	31.4	2,370	
22- 9	69,875	-	69,871	4,340	31.4	2,330	
7-10	71,765	-	71,761	4,457	31.4	2,320	
29-10	72,876	-	72,872	4,526	31.3	2,310	
10-11	76,658	-	76,654	4,761	30.6	2,310	
26-11	78,604	-	78,600	4,882	28.0	2,260	
11-12	80,377	-	80,373	4,992	31.3	2,340	
26-12-84	82,478	-	82,474	5,123	30.9	2,400	
13- 1-85	82,845	0	82,841	5,145	-	-	New pump (II) operation q=6ℓ/s t=1hrs
27- 1	82,845	302	83,142	5,164	-	-	"
10- 2	82,845	604	83,445	5,183	-	-	"
24- 2	83,727	906	84,629	5,256	31.1	2,280	"
10- 3	85,206	1,208	86,410	5,367	30.0	2,250	"
27- 3	86,403	1,575	87,974	5,464	31.0	2,260	"
8- 4	87,078	1,834	88,908	5,522	29.1	2,240	"
22- 4	87,585	2,136	89,717	5,572	27.2	2,160	"
12- 5	88,884	2,568	91,448	5,680	31.0	2,300	"
26- 5	90,041	2,870	92,907	5,771	31.2	2,280	"
8- 6	91,179	3,151	94,326	5,859	31.2	2,290	"
26- 6	92,344	3,539	95,879	5,955	31.7	2,220	"
8- 7	93,447	3,798	97,241	6,040	31.9	2,240	"
23- 7	94,651	4,122	98,769	6,135	31.3	2,240	"
11- 8	95,903	4,532	100,431	6,238	31.5	2,250	"

Water Use Record of Production Farm (10/16)

°Name of Farm ; ABU-ABALI (I)
°Area of Farm ; Af=6.79 ha
°Cropping Area ; Ac=4.01 ha
°Crops ; Veg.(1.51), Alf. and Dates Young Tree (2.50)

°Cumulative Flow Meter No. 2,545
° " No. 2,540
°Type of Well, Handdug Well L=12.4m
°Type of Pump, Volute pump ϕ=3"x2

Date	Reading		Water use		W.T	EC	Remarks
	Pump I	Pump II	Volume	Depth			
D.M.Y.	(cu.m)	(cu.m)	(cu.m)	V/Ac(mm)	(°C)	(μs/cm)	
7- 3-83	5	-	0	0	31.7	1,982	Mixed Farm
10- 3	602	-	597	15	32.4	1,992	
21- 3	2,433	-	2,428	61	32.5	1,998	
9- 4	5,302	-	5,297	132	32.6	1,950	
19- 4	6,990	-	6,985	174	32.5	1,900	
30- 4	9,200	-	9,195	229	32.6	1,922	
11- 5	12,207	-	12,202	304	32.5	1,925	
21- 5	14,370	-	14,365	350	32.6	1,941	
5- 6	17,798	-	17,793	444	32.7	1,920	
20- 6	21,434	-	21,429	534	32.6	1,956	
3- 7	22,865	-	22,860	570	34.2	2,010	
16- 7	24,658	-	24,653	615	32.7	1,960	
2- 8	28,169	-	28,164	702	32.3	2,000	
14- 8	30,548	-	30,543	762	32.7	1,980	
27- 8	33,531	-	33,526	836	32.1	1,980	
4- 9	35,092	-	35,087	875	32.0	2,000	
29-10	46,180	-	46,175	1,151	32.5	2,010	
13-11	49,099	-	49,094	1,224	32.5	2,020	
28-11	50,659	-	50,654	1,263	27.6	1,885	
11-12	52,603	-	52,598	1,312	32.5	1,960	
25-12-83	54,301	-	54,296	1,354	32.2	1,980	
10- 1-84	56,195	-	56,190	1,401	32.3	1,980	
24- 1	58,227	-	58,222	1,452	27.7	1,829	
6- 2	59,967	-	59,962	1,495	27.1	1,808	
19- 2-84	62,299	-	62,294	1,553	32.1	1,965	
3- 3	64,672	-	64,667	1,613	32.4	1,986	
17- 3	67,362	-	67,357	1,680	32.4	1,974	
1- 4	70,461	-	70,456	1,757	32.7	1,962	
14- 4	73,342	-	73,337	1,829	30.6	1,940	
29- 4	76,679	-	76,674	1,912	32.6	1,960	
12- 3	80,051	-	80,046	1,996	32.7	1,960	
26- 5	83,449	-	83,444	2,071	32.7	1,980	
9- 6	86,987	-	86,982	2,169	32.6	2,000	
23- 6	89,990	-	89,985	2,244	32.7	2,030	
9- 7	93,493	-	93,488	2,331	33.1	2,070	
22- 7	96,470	-	96,465	2,406	33.0	2,180	
7- 8	98,873	-	98,868	2,466	32.7	2,300	
26- 8	101,210	-	101,205	2,524	32.8	2,190	

(continuing)

(continued)

Date D.M.Y.	Reading Pump I (cu.m)	Reading Pump II (cu.m)	Water use Volume (cu.m)	Water use Depth V/Ac(mm)	W.T (°C)	EC (µs/cm)	Remarks
10- 9-84	-	-	-	-	32.8	2,170	
22- 9	103,590	-	103,585	2,583	32.6	2,130	
7-10	103,590	0 (41,656)	103,585	2,583	33.1	2,070	
29-10	103,590	796 (42,452)	104,381	2,603	30.9	2,010	
11-11	103,590	3,496 (45,152)	107,081	2,670	32.5	2,060	
26-11	103,590	6,140 (47,796)	109,725	2,736	29.9	1,980	
11-12	103,748	8,870 (50,526)	112,613	2,808	-	-	
26-12-84	103,748	12,401 (54,057)	116,144	2,896	-	-	
13- 1-85	103,748	15,346 (57,002)*	119,089	2,970	32.3	2,060	
27- 1	103,748	15,346 (57,002)*	119,089	2,970	31.5	2,060	
10- 2	103,748	15,346 (57,002)*	119,089	2,970	31.5	2,060	
24- 2	103,748	15,346 (57,002)*	119,089	2,970	32.3	2,150	
10- 3	103,748	15,346 (57,002)*	119,089	2,970	32.5	2,210	
27- 3	103,748	15,346 (57,002)*	119,089	2,970	32.5	2,100	
8- 4	103,748	15,346 (57,002)*	119,089	2,970	-	-	
22- 4	103,748	15,346 (57,002)*	119,089	2,970	32.4	2,060	
12- 5	103,748	15,346 (57,002)*	119,089	2,970	31.5	2,090	
26- 5	103,748	15,346 (57,002)*	119,089	2,970	32.4	2,030	
8- 6	103,748	15,346 (57,002)*	119,089	2,970	32.5	2,040	
26- 6	103,748	15,346 (57,002)*	119,089	2,970	32.6	2,040	
8- 7	103,748	15,346 (57,002)	119,089	2,970	32.7	2,050	
23- 7	103,748	17,489 (59,145)	121,232	3,023	32.7	2,010	
11- 8	103,748	21,540 (63,186)	125,283	3,124	32.6	1,990	

* Meter unworkable.

Water Use Record of Production Farm (11/16)

°Name of Farm ; ABU-ABALI (II)
°Area of Farm ; Af=0.88 ha
°Cropping Area ; Ac=0.88 ha
°Crops ; Dates(0.88)

°Cumulative Flow Meter No. 2,550
° " No. -
°Type of Well, Handdug Well L=10.9m
°Type of Pump, Volute pump ϕ=3"

Date	Reading		Water use		W.T	EC	Remarks
	Pump I	Pump II	Volume	Depth			
D.M.Y.	(cu.m)	(cu.m)	(cu.m)	V/Ac(mm)	(°C)	(μs/cm)	
8- 3-83	6	-	0	0	28.5	4,410	Date palm Farm
10- 3	29	-	23	3	28.6	4,460	
21- 3	404	-	398	45	22.4	3,990	
9- 4	1,222	-	1,216	138	26.6	3,780	
19- 4	1,222	-	1,216	138	25.4	4,440	
30- 4	1,237	-	1,231	140	27.2	4,590	
11- 5	2,344	-	2,338	266	30.9	4,730	
21- 5	3,523	-	3,517	400	30.6	4,600	
5- 6	4,209	-	4,203	478	29.7	4,880	
10- 6	4,371 1/	-	4,365	496	-	-	
3- 7	4,371	-	4,365	496	31.9	4,920	
16- 7	4,440	-	4,434	503	30.0	5,160	
14- 8	-	-	-	-	-	-	
4- 9	5,910	-	5,904	671	30.5	4,890	
15-10	6,520	-	6,514	740	25.8	6,090	
29-10	6,520	-	6,514	740	22.9	6,240	
10-11	6,520	-	6,514	740	22.3	6,990	
28-11	6,520	-	6,514	740	22.5	7,720	
11-12	6,520	-	6,514	740	-	-	
25-12-83	6,542	-	6,536	743	18.1	4,270	
10- 1-84	6,542	-	6,536	743	18.6	4,580	
24- 1	6,542	-	6,536	743	18.8	-	
6- 2	6,542	-	6,536	743	17.3	4,950	
18- 2	6,542	-	6,536	743	18.2	5,430	

(continuing)

Note: 1/ Meter taken out.

(continued)

Date D.M.Y.	Reading Pump I (cu.m)	Reading Pump II (cu.m)	Water use Volume (cu.m)	Water use Depth V/Ac(mm)	W.T (°C)	EC (µs/cm)	Remarks
3- 3-84	6,542	-	6,536	743	20.5	6,150	
17- 3	6,542	-	6,536	743	25.0	7,820	
1- 4	6,542	-	6,536	743	23.8	9,140	
14- 4	6,542	-	6,536	743	24.9	-	
29- 4	6,542	-	6,536	743	23.2	7,260	
12- 5	-	-	-	-	29.2	5,280	
26- 5	-	-	-	-	29.5	4,840	
9- 6	-	-	-	-	30.4	4,710	
23- 6	-	-	-	-	30.8	4,580	
9- 7	-	-	-	-	31.0	4,600	
25- 7	6,545	-	0	0	-	-	
7- 8	6,916	-	371	42	30.9	4,760	
26- 8	9,026	-	2,110	240	30.8	4,910	
10- 9	9,125	-	2,580	293	30.3	5,210	
22- 9	9,125*	-	2,580	293	26.8	5,690	

* Meter taken out.

Water Use Record of Production Farm (12/16)

°Name of Farm ; BILIAH
°Area of Farm ; Af=2.80 ha
°Cropping Area ; Ac=2.80 ha
°Crops ; Veg.(0.90), Alf.(0.80)
Dates, Lime Young Tree
(1.10)

°Cumulative Flow Meter No. 2,549 (I)
° " No. 2,544 (II)
°Type of Well, Handdug Well L=14.5m
°Type of Pump, Voulte pump ϕ=3"x2 units

Date	Reading		Water use		W.T	EC	Remarks
	Pump I	Pump II	Volume	Depth			
D.M.Y.	(cu.m)	(cu.m)	(cu.m)	V/Ac(mm)	(°C)	(μs/cm)	
21- 3-83	1,554	6	-	-	32.6	2,120(I)	New Mixed
					29.7	1,986(II)	Farm
9- 4	2,056	1,644	2,140	76	33.0	1,790	
19- 4	2,508	2,298	3,246	116	32.7	2,100	
30- 4	2,702	4,080	5,222	186	33.0	2,110	
11- 5	-	4,697	-	-	-	-	
21- 5	5,990	4,697	9,127	326	32.8	2,080	
5- 6	6,505	7,018	11,963	427	33.1	2,060	
19- 6	8,515	7,553	14,508	518	33.3	2,070	
3- 7	10,825	8,050	17,315	618	33.4	2,070	
16- 7	12,943	8,068	19,451	695	33.0	2,110	
2- 8	15,567	8,309	23,406	836	32.8	2,170	
13- 6	19,363	8,309	26,112	933	33.5	2,260	
4- 9	19,609	9,224	27,273	974	32.9	2,280	
15-10	24,640	9,774	32,854	1,173	32.8	2,240	
29-10	26,774	9,774	34,958	1,248	32.6	2,360	
13-11	28,439	9,774	36,653	1,309	28.5	2,170	
28-11	29,284	10,631	38,355	1,370	32.5	2,330	
11-12	30,791	10,652	39,883	1,424	25.7	2,170	
25-12-83	32,298	10,652	41,390	1,478	32.3	2,390	
10- 1-84	33,445	10,658	42,543	1,519	32.1	2,460	
24- 1	35,270	10,669	44,379	1,585	25.2	2,170	
6- 2	36,190	10,669	45,299	1,618	32.5	2,430	
19- 2	38,214	10,669	47,323	1,690	32.3	2,370	
3- 3	39,310	10,797	48,547	1,734	32.5	2,350	
17- 3	41,012	11,340	50,792	1,814	32.8	2,370	
1- 4	42,369	12,031	52,840	1,887	32.9	2,330	
14- 4	43,539	12,994	54,973	1,963	32.8	-	
29- 4	43,539	15,849	57,828	2,065	32.9	2,230	
12- 5	43,539	18,171	60,150	2,148	33.0	2,190	
26- 5	43,540	20,517	62,497	2,232	33.3	2,120	
9- 6	43,540	22,897	64,877	2,317	32.9	2,180	
23- 6	43,540	25,120	67,100	2,396	32.9	2,140	
9- 7	43,550	26,947	68,937	2,462	33.1	2,220	
22- 7	43,550	28,952	70,942	2,534	33.0	2,190	
26- 7	43,701	29,209	71,350	2,548	32.9	2,240	
7- 8	43,924	30,291	72,655	2,595	32.9	2,270	
26- 8	43,924	33,011	75,375	2,692	32.9	2,190	

(continuing)

(continued)

Date D.M.Y.	Reading Pump I (cu.m)	Reading Pump II (cu.m)	Water use Volume (cu.m)	Water use Depth V/Ac(mm)	W.T (°C)	EC (µs/cm)	Remarks
10- 9-84	43,924	35,176	77,540	2,769	33.0	2,190	
22- 9	43,924	36,965	79,320	2,833	32.9	2,190	
7-10	43,924	39,394	81,758	2,920	32.8	2,140	
29-10	-	-	-	-	-	-	
11-11	43,924	43,643	86,007	3,072	32.7	2,190	
26-11	43,924	45,561	87,925	3,140	32.5	2,170	
11-12	43,924	47,606	89,970	3,213	26.8	2,000	
26-12-84	43,924	49,228	91,592	3,271	32.6	2,270	
13- 1-85	43,924	50,792	93,156	3,327	32.4	2,270	
27- 1	44,593	51,603	94,636	3,380	32.5	2,250	
10- 2	45,759	52,312	96,511	3,447	32.6	2,180	
24- 2	45,949	54,206	98,595	3,521	32.6	2,140	
10- 3	45,949	55,926	100,315	3,583	32.7	2,160	
27- 3	45,949	58,445	102,834	3,673	32.8	2,120	
8- 4	45,949	59,869	104,258	3,724	32.6	2,160	
22- 4	45,949	61,675	106,064	3,788	32.5	2,090	
13- 5	45,949	64,499	108,888	3,889	33.2	2,090	
26- 5	45,949	66,151	110,540	3,948	32.6	2,030	
8- 6	45,949	68,169	112,558	4,020	32.9	1,963	
26- 6	45,949	70,269	114,658	4,095	33.1	1,972	
9- 7	45,949	72,139	116,528	4,162	38.3	1,930	
23- 7	45,949	73,359	117,748	4,205	33.0	1,890	
11- 8-85	45,949	75,015	119,404	4,264	33.0	1,960	

Water Use Record of Production Farm (13/16)

°Name of Farm ; UQDAH
°Area of Farm ; Af=1.70 ha
°Cropping Area ; Ac=1.35 ha
°Crops ; Date, Lime, Mango(1.20)
Veg.(0.15)

°Cumulative Flow Meter No. 2,532
° " No. -
°Type of Well, Handdug Well L=12.2 m
°Type of Pump, Volute pump ϕ=3"x1 unit

Date	Reading		Water use		W.T	EC	Remarks
D.M.Y.	Pump I (cu.m)	Pump II (cu.m)	Volume (cu.m)	Depth V/Ac(mm)	(°C)	(μs/cm)	
27- 2-83	3	-	0		26.8	3,040	Date palm Farm
1- 3	15	-	12	1	25.2	3,000	
10- 3	27	-	24	2	23.5	2,880	
21- 3	166	-	163	12	22.6	2,810	
9- 4	266	-	263	19	27.4	2,550	
19- 4	1,181	-	1,178	87	31.3	3,220	
30- 4	2,061	-	2,058	152	31.7	3,360	
11- 5	2,635	-	2,632	195	30.6	3,300	
21- 5	3,240	-	3,237	240	30.2	3,290	
6- 6	4,234	-	4,231	313	31.3	3,290	
19- 6	4,787	-	4,784	354	30.9	3,190	
3- 7	6,548	-	6,545	485	31.4	3,210	
16- 7	8,472	-	8,469	627	31.3	3,200	
2- 8	10,018	-	10,015	742	30.8	3,220	
13- 8	10,101	-	10,098	748	30.0	3,110	
27- 8	11,537	-	11,534	854	31.3	3,240	
4- 9	12,874	-	12,871	953	31.3	3,270	
15-10	16,736	-	16,733	1,239	29.1	3,220	
29-10	17,514	-	17,151	1,270	30.2	3,060	
13-11	18,179	-	18,176	1,346	31.2	3,300	
28-11	19,446	-	19,443	1,440	30.6	3,060	
11-12	20,267	-	20,264	1,501	25.9	3,190	
25-12	21,399	-	21,396	1,585	24.9	2,890	
10- 1-84	22,090	-	22,087	1,636	31.0	3,240	
24- 1	23,605	-	23,602	1,748	31.1	3,330	
6- 2	25,290	-	25,287	1,873	31.2	3,260	
19- 2	26,661	-	26,658	1,975	31.1	3,290	
3- 3	28,107	-	28,104	2,082	30.3	3,340	
17- 3	29,030	-	29,027	2,150	31.3	3,350	
1- 4	30,853	-	30,850	2,285	31.3	3,320	
14- 4	32,857	-	32,854	2,434	31.5	-	
29- 4	34,775	-	34,772	2,575	31.2	3,370	

(continuing)

(continued)

Date	Reading		Water use		W.T	EC	Remarks
	Pump I	Pump II	Volume	Depth			
D.M.Y.	(cu.m)	(cu.m)	(cu.m)	V/Ac(mm)	(°C)	(µs/cm)	
12- 5-84	36,166	-	36,163	2,679	31.4	3,360	
26- 5	38,120	-	38,117	2,823	31.9	3,230	
9- 6	40,406	-	40,403	2,993	31.2	3,350	
23- 6	42,273	-	42,270	3,131	31.4	3,320	
9- 7	44,496	-	44,493	3,296	31.5	3,350	
22- 7	45,500	-	45,497	3,370	30.5	3,320	
7- 8	45,667	-	45,664	3,383	30.4	3,300	
26- 8	47,063	-	47,060	3,486	30.6	3,230	
10- 9	48,769	-	48,766	3,612	31.5	3,280	
22- 9	50,272	-	50,269	3,724	31.2	3,290	
7-10	52,264	-	52,261	3,871	27.7	3,120	
29-10	52,807	-	52,804	3,911	31.0	3,260	
11-11	55,857	-	55,854	4,137	31.3	3,270	
26-11	55,953	-	55,950	4,144	31.4	3,230	
11-12	57,570	-	57,567	4,264	28.1	3,050	
26-12-84	58,323	-	58,320	4,320	30.3	3,270	
13- 1 85	59,348	-	59,345	4,396	26.9	3,020	
27- 1	59,673	-	59,670	4,420	25.2	2,870	
10- 2	59,978	-	59,975	4,443	22.3	2,890	
24- 2	60,345	-	60,342	4,470	27.0	2,910	
10- 3	60,849	-	60,846	4,507	25.9	3,020	
27- 3	61,760	-	61,757	4,575	31.1	3,290	
8- 4	62,227	-	62,218	4,609	31.1	3,300	
22- 4	62,251	-	62,242	4,611	30.8	3,280	
13- 5	62,401	-	62,398	4,622	30.0	3,250	
26- 5	62,401	-	62,398	4,622	31.2	3,360	
8- 6	63,042	-	63,039	4,670	31.3	3,340	
26- 6	64,051	-	64,048	4,744	30.6	3,310	
6- 7	64,061	-	64,058	4,745	31.8	3,290	
23- 7	64,791	-	64,788	4,799	30.2	3,190	
11- 8-85	66,108	-	66,105	4,897	31.5	3,430	

Water Use Record of Production Farm (14/16)

°Name of Farm ; LASHCO
°Area of Farm ; Af=5.31 ha
°Cropping Area ; Ac=3.82 ha
°Crops ; Veg.(1.64), Alf.(2.18)

°Cumulative Flow Meter No. 1,075 (I)
° " No. 2,551 (II)
° " No. 2,511 (III)
°Type of Well, Borehold Well L=50 m
°Type of Pump, Borehole pump
φ=4"x1 φ=3"x2

Date	Reading		Water use		W.T	EC	Remarks
D.M.Y.	Pump I (cu.m)	Pump II (cu.m)	Volume (cu.m)	Depth V/Ac(mm)	(°C)	(μs/cm)	
3- 3-83	(40)	-	-		31.9 -	6,170(I) -	New Mixed Farm with pasture
5- 3	695	0	0		30.0 -	6,570(I) -	
7- 3	1,140	56	501	13	32.1 31.4	6,330(I) 4,420(II)	
10- 3	1,832	413	1,550	41	32.0 31.5	6,640 4,470	
21- 3	4,046	1,836	5,187	136	32.2 32.0	6,760 4,390	
9- 4	7,880	3,673	10,858	284	- -	- -	
19- 4	9,675	4,343	13,323	349	32.1 32.2	6,700 4,200	
30- 4	11,890	5,675	16,870	442	32.7 -	6,900 -	
11- 5	13,952	7,202	20,456	535	30.0 31.9	6,630 4,440	
21- 5	16,458	8,388	24,151	632	31.9 31.6	6,550 4,280	
5- 6	19,984	10,920	30,209	791	31.9 31.9	6,610 4,340	
19- 6	23,255	13,211	35,771	936	32.0 32.3	6,230 4,270	
3- 7	26,604	15,312	41,221	1,079	32.2 -	6,360 -	
16- 7	29,290	16,939	45,534	1,192	32.0 32.4	6,220 4,230	
2- 8	33,396	18,596	51,297	1,343	31.9 31.6	6,080 4,190	
13- 8	36,273	20,668	56,246	1,472	30.9 32.1	6,680 4,230	
27- 8	39,491	23,174	61,970	1,622	32.2 32.3	6,000 4,330	
4- 9	41,311	24,369	64,985	1,701	32.0 31.3	5,943 4,300	

(continuing)

(continued)

Date D.M.Y.	Reading Pump I (cu.m)	Reading Pump II (cu.m)	Water use Volume (cu.m)	Water use Depth V/Ac(mm)	W.T (°C)	EC (µs/cm)	Remarks
15-10	51,170	27,825	78,300	2,050	31.9	5,790(I)	
					32.3	4,320(II)	
29-10	54,378	29,595	83,278	2,180	31.8	5,650	
					31.6	4,270	
13-11	56,110	31,084	86,499	2,264	31.7	5,830	
					32.0	4,360	
28-11	57,944	32,814	90,063	2,358	31.9	5,780	
					31.7	4,330	
11-12	60,476	34,363	94,144	2,465	31.9	5,720	
					32.0	4,290	
15-12	62,660	34,899	96,864	2,536	31.6	5,300	
					18.2	3,640	
10- 1-84	64,754	35,416	99,475	2,604	31.7	5,700	
					31.4	4,300	
24- 1	67,166	36,706	103,177	2,701	24.5	5,200	
					23.4	3,060	
6- 2	69,617	38,307	107,229	2,807	31.7	5,490	
					31.5	4,240	
19- 2	71,514	40,262	111,081	2,908	31.1	5,440	
					30.4	4,130	
3- 3	73,622	42,177	115,104	3,013	31.4	5,450	
					31.5	4,070	
17- 3	75,792	44,499	119,596	3,131	-	-	
					32.7	4,130	
1- 4	78,329	46,891	124,525	3,260	31.7	5,320	
					31.8	4,080	
14- 4	80,866	48,916	129,087	3,379	31.6	-	
					31.7	-	
29- 4	83,931	51,359	134,595	3,523	31.5	5,150	
					30.9	4,040	
12- 5	86,178	53,322	138,805	3,634	31.7	5,200	
					31.9	4,130	
26- 5	89,071	55,622	143,998	3,770	31.7	5,100	
					32.3	4,100	
9- 6	92,296	57,610	149,211	3,906	31.6	5,120	
					31.4	4,040	
23- 6	94,848	59,131	153,284	4,013	31.4	5,180	
					31.6	4,100	
9- 7	98,055	61,284	158,644	4,153	31.6	5,100	
					31.7	4,070	
22- 7	101,113	63,494	163,912	4,291	-	-	
					32.4	4,070	
7- 8	104,740	66,176	170,221	4,456	31.5	5,070	
					31.7	3,990	
26- 8	108,804	69,322	177,431	4,645	31.5	5,050	
					31.9	4,000	

(continued)

Date D.M.Y.	Reading Pump I (cu.m)	Reading Pump II (cu.m)	Water use Volume (cu.m)	Water use Depth V/Ac(mm)	W.T (°C)	EC (µs/cm)	Remarks
10- 9-84	111,448	71,160	181,913		32.0 32.1	5,200(I) 4,000(II)	
22- 9	113,600	-	-		31.4 -	5,140 -	
7-10	116,094	-	-		31.2 -	5,240 -	
29-10	119,552	75,589	194,446		- -	- -	
10-11	120,256	76,005	195,566		- 31.6	- 4,070	
26-11	122,906	78,206	200,417		31.2 31.6	5,710 4,020	
11-12	124,565	80,079	203,949		30.9 31.4	5,260 4,010	
26-12-84	126,044	81,385	206,734		- 31.8	- 3,760	
13- 1-85	127,018	82,658	208,981		- 30.4	- 4,100	
27- 1	127,835	83,038	210,178		- -	- -	
10- 2	129,109	*	211,452		-	-	* Pump(II) and well unused
24- 2	130,722		213,065		-	-	
10- 3	131,766		214,109		-	-	
27- 3	131,797		214,140		-	-	
8- 4	131,797		214,140		-	-	
22- 4	*		214,140		-	-	* Pump(I) not operated
12- 5			214,140				
26- 5			214,140				
8- 6			214,140				
26- 6			214,140				
9- 7			214,140				
23- 7			214,140				
11- 8-85			214,140				

(continued)

Date D.M.Y.	Reading Pump III (cu.m)	Water use Volume (cu.m)	Water use Depth V/Ac(mm)	W.T (°C)	EC (µs/cm)	Remarks
10- 9-84	0	0		-	-	
22- 9	2,838	2,838		-	-	
7-10	6,385	6,385		-	-	
29-10	11,588	11,588		33.5	1,747	
	(37,249)					
10-11	(39,678)	14,017		33.5	1,747	
26-11	(42,645)	16,984		33.5	1,678	
11-12	(45,153)	19,492		33.5	1,592	
26-12-84	(46,343)	20,682		-	-	
13- 1-85	(48,201)	22,540		-	-	
27- 1	(49,038)	23,377		30.2	1,370	
10- 2	(49,050)	23,389		30.5	1,592	
24- 2	(54,062)	28,401		29.2	1,469	
10- 3	(56,401)	30,740		32.0	1,411	
27- 3	(58,862)	33,201		-	-	
8- 4	(58,862)	33,201		-	-	
22- 4	(58,862)	33,201		24.7	1,435	
12- 5	(60,311)	34,650		-	-	
26- 5	(63,835)	38,174		33.2	1,408	
8- 6	(67,690)	42,029		33.5	1,438	
26- 6	(74,470)	48,809		34.3	1,425	
9- 7	(80,010)	54,349		36.8	1,400	
23- 7	(85,539)	59,878		33.6	1,330	
11- 8-85	(93,071)	67,410		34.0	1,340	

(continued)

Date	Water use	
	Volume	Depth
	(I+II+III)=Total	
D.M.Y.	(cu.m)	V/Ac(mm)
10- 9-84	181,913	4,762
22- 9	-	-
7-10	-	-
29-10	206,034	5,394
10-11	209,583	5,486
26-11	217,401	5,691
11-12	223,441	5,849
26-12-84	227,416	5,953
13- 1-85	231,521	6,061
27- 1	233,555	6,114
10- 2	234,841	6,148
24- 2	241,466	6,321
10- 3	244,849	6,410
27- 3	247,341	6,475
8- 4	247,341	6,475
22- 4	247,341	6,475
12- 5	248,790	6,513
26- 5	252,314	6,605
8- 6	256,169	6,705
26- 6	262,949	6,883
9- 7	268,489	7,029
23- 7	274,018	7,173
11- 8-85	281,550	7,370

Water Use Record of Production Farm (15/16)

°Name of Farm ; BARKA' (I)
°Area of Farm ; Af=8.40 ha
°Cropping Area ; Ac=3.70 ha 1/
°Crops ; Veg.(3.00) Alf.(0.70)
°Cumulative Flow Meter No. 2,541 (I)
° " No. 2,543 (II)
°Type of Well, Borehole H=50 m
°Type of Pump, Borehole Pump φ=3"x2 units

Date	Reading		Water use		W.T	EC	Remarks
	Pump I	Pump II	Volume	Depth			
D.M.Y.	(cu.m)	(cu.m)	(cu.m)	V/Ac(mm)	(°C)	(μs/cm)	
29- 1-83	9	-	0		-	-	New Farm
17- 2	1,258	-	1,249	34	23.9	1,289	
1- 3	2,543	-	2,534	68	32.5	1,584	
10- 3	3,442	-	3,433	93	32.6	1,625	
21- 3	4,829	-	4,820	130	32.8	1,691	
9- 4	7,551	-	7,542	204	33.0	1,482	
19- 4	9,103	-	9,094	246	32.4	1,704	
30- 4	11,330	-	11,321	306	33.0	1,775	
11- 5	13,697	-	13,688	370	33.0	1,825	
21- 5	15,915	-	15,906	430	33.0	1,821	
5- 6	19,595	-	19,586	529	33.2	1,800	
19- 6	22,964	-	22,955	620	33.0	1,748	
3- 7	26,258	-	26,249	709	33.1	1,752	
16- 7	28,861	-	28,852	780	32.9	1,716	
2- 8	31,773	-	31,764	858	32.9	1,709	
13- 8	32,535	-	32,516	879	33.0	1,702	
27- 8	33,483	-	33,474	905	33.0	1,652	
4- 9	33,807	New Pump 0	33,798	913	32.8	1,670	New Farm Installed
15-10	34,680	8,625 2/	42,936	1,160	32.9	1,662	
29-10	35,220	11,087"	46,298	1,251	32.8	1,620	
13-11	35,642	14,111"	49,744	1,344	32.8	1,711	
28-11	35,714	17,315"	52,840	1,428	32.7	1,754	
11-12	36,177	19,755"	55,923	1,511	32.8	1,795	
25-12-83	37,204	22,577"	59,772	1,615	32.7	1,846	

(continuig)

Notes: 1/ The cropping area quoted is based on that in spring season, 1984.

2/ According to interview survey, the daily water lifting capacity by pump (V) is estimated by following equation;

$V = t \times q$

where, t=Daily average operation hours (8hrs.)
q=Lifting capacity (7 ℓ/s)

(continued)

Date	Reading		Water use		W.T	EC	Remarks
	Pump I	Pump II	Volume	Depth			
D.M.Y.	(cu.m)	(cu.m)	(cu.m)	V/Ac(mm)	(°C)	(µs/cm)	
10- 1-84	37,519	25,802 2/	63,312	1,711	32.6	1,913	
6- 2	37,958	31,245"	69,194	1,870	32.5	1,859	
14- 2	38,416	33,865"	72,272	1,953	32.4	1,861	
3- 3	39,098	36,284"	75,373	2,037	32.2	1,805	
19- 3	39,519	39,509"	79,019	2,136	32.6	1,846	
1- 4	39,999	42,129"	82,119	2,219	32.8	1,784	
14- 4	40,524	44,749"	85,264	2,304	32.8	-	
29- 4	14,180	47,773"	88,944	2,404	32.7	1,650	
12- 5	41,516	50,393"	91,900	2,493	33.0	1,630	
27- 5	42,517	53,417"	59,925	2,593	32.8	1,590	
9- 6	42,654	56,037"	98,682	2,667	32.8	1,580	
23- 6	43,037	58,859"	101,887	2,754	33.0	1,502	
9- 7	43,456	62,084" (17,777)	105,531	2,852	33.1	1,460	
17- 7	43,679	-	-	-	33.4	1,480	
22- 7	43,713	63,291 (18,984)	106,955	2,892	33.0	1,473	
7- 8	44,021	66,740 (22,433)	110,752	2,993	32.9	1,470	
26- 8	44,387	70,575 (26,268)	114,953	3,107	32.9	1,470	
10- 9-84	44,528	73,667 (29,360)	117,186	3,167	33.0	1,437	
22- 9	44,787	76,219 (31,912)	120,997	3,270	32.9	1,388	
7-10	45,104	79,352 (35,045)	124,447	3,363	32.8	1,398	
29-10	45,944	83,893 (39,586)	129,828	3,509	32.7	1,362	
11-11	46,340	85,669 (41,362)	132,000	3,568	32.8	1,392	
26-11	46,612	88,166 (43,859)	134,769	3,642	32.6	1,320	
11-12	46,937	90,582 (46,275)	137,510	3,716	32.7	1,349	
26-12-84	47,365	92,857 (48,550)	140,213	3,790	32.6	1,317	
13- 1-85	-	-	-	-	-	-	
27- 1	48,787	96,412 (52,105)	145,190	3,924	32.2	1,320	
12- 2	48,852	99,905 (55,598)	148,748	4,020	32.6	1,369	
24- 2	49,086	101,884 (57,577)	150,961	4,080	32.3	1,346	
11- 3	49,211	104,796 (60,489)	153,998	4,162	32.3	1,300	

(continued)

Date D.M.Y.	Reading Pump I (cu.m)	Reading Pump II (cu.m)	Water use Volume (cu.m)	Water use Depth V/Ac(mm)	W.T (°C)	EC (µs/cm)	Remarks
27- 3	49,375	108,423 (64,114)	157,789	4,265	32.8	1,335	
9- 4	49,507	111,488 (67,179)	160,986	4,351	32.7	1,367	
22- 4	46,627	114,613 (70,304)	164,231	4,439	35.0	1,290	
26- 5	-	-	-	-	-	-	
8- 6	50,080	126,656 (82,347)	176,727	4,776	32.8	1,272	
9- 7	53,887	129,085 (84,776)	182,963	4,945	33.2	1,230	
15- 8-85	54,698	136,132 (91,823)	190,821	5,157	33.1	1,283	

Water Use Record of Production Farm (16/16)

°Name of Farm ; BARKA' (I)
°Area of Farm ; Af=2.25 ha
°Cropping Area ; Ac=1.95 ha
°Crops ; Dates(1.65) Alf.(0.30)

°Cumulative Flow Meter No. 2,511 (I)
° " No. 2,540 (II)
°Type of Well, Handdug Well L=15.0 m
°Type of Pump, Volute pump ϕ=3"x2 units

Date D.M.Y.	Reading Pump I (cu.m)	Reading Pump II (cu.m)	Water use Volume (cu.m)	Water use Depth V/Ac(mm)	W.T (°C)	EC (μs/cm)	Remarks
17- 2-85	1,027	0	0		29.9	2,360	Mixed Farm
1- 3	2,539	5	1,517	78	30.7	2,390	
10- 3	2,959	1,064	2,632	132	31.1	2,240	
21- 3	3,355	2,262	4,590	235	31.5	2,340	
9- 4	4,291	4,534	7,798	400	32.0	2,040	
19- 4	5,292	5,375	9,640	494	31.4	2,380	
30- 4	5,470 1/	6,882	11,325	581	31.9	2,330	
5- 5	5,470 1/	8,222	12,665	649	31.9	2,280	
21- 5	5,470 1/	9,494	13,937	715	31.6	2,340	
5- 6	5,470 1/	10,469	14,912	765	31.8	2,290	
25- 6	5,470 1/	12,707	17,150	879	-	-	
3- 7	5,470 1/	13,558	18,001	923	32.2	2,260	
8- 7	5,470 1/	-	-	-	-	-	
16- 7	6,867	14,581	20,421	1,047	31.8	2,260	
2- 8	8,546	16,204	23,723	1,217	31.6	2,280	
13- 8	9,498	17,370	25,841	1,325	31.8	2,330	
27- 8	10,685	18,835	28,493	1,467	31.9	2,290	
4- 9	11,309	19,908	30,190	1,548	30.9		
15-10	14,064	24,821	37,858	1,941	31.7	2,260	
29-10	16,003	25,355 2/	40,331	2,068	31.4	2,250	
13-11	18,022	25,355 2/	42,350	2,172	28.3	2,220	
28-11	19,692	25,379	44,044	2,259	31.4	2,250	
11-12	21,708	25,538	46,219	2,370	31.3	2,270	
25-12-83	22,680	26,759	48,412	2,483	29.7	2,150	
10- 1-84	24,444	27,312	50,729	2,601	31.4	2,250	
24- 1	25,505	28,367	52,845	2,710	26.7	2,060	
6- 2	26,222	29,154	54,349	2,787	31.0	2,300	
19- 2-84	26,905	30,068	55,946	2,869	30.6	2,280	

(continuing)

Note: 1/ Meter taken out from 30, April to 8, July.
2/ Pump under repair.

(continued)

Date D.M.Y.	Reading Pump I (cu.m)	Reading Pump II (cu.m)	Water use Volume (cu.m)	Water use Depth V/Ac(mm)	W.T (°C)	EC (µs/cm)	Remarks
3- 3-84	27,406	31,200	57,579	2,953	31.1	2,310	
17- 3	27,945	32,491	59,409	3,047	31.5	2,340	
1- 4	28,575	33,174	61,262	3,142	24.9	2,130	
14- 4	29,094	34,925	62,992	3,230	31.7	-	
29- 4	29,635	36,630	65,238	3,346	31.6	2,310	
12- 5	31,131	37,140	67,244	3,448	31.8	-	
26- 5	31,783	38,421	69,177	3,548	32.0	2,400	
9- 6	33,784	38,431	71,188	3,650	31.5	2,370	
23- 6	34,938 3/	38,922 4/	72,833	3,735	31.8	2,310	
9- 7	35,523 3/	40,464 4/	74,960	3,844	32.0	2,390	
22- 7	35,523 3/	40,464 4/	74,960	3,844	32.2	2,350	
7- 8	35,523 3/	40,464 4/	74,960	3,844	-	-	
26- 8	35,523 3/	40,951	75,447	3,869	31.7	2,420	

Note: 3/ Meter taken out.
4/ Pump not operated.

Appendix E-3

Observation Data of the Water Use in the Selected Six Aflaj.

Water Use of Falaj Al-Bilad (1) $Q = 1.209\ (h - 0.012)^{3/2}$

Date	Term(t) (day)	Depth of Canal(h) (m)	Water Temp. (°C)	E.C (μs/cm)	Discharge Q (m^3/s)	Average $\overline{Q}$ (m^3/s)	Water use $V = t x \overline{Q}$ ($10^3 m^3$)	ΣV ($10^3 m^3$)	Water use ΣV/A(40.0 ha) (mm)	Remarks
13-6-'83	-	0.25	32.3	607	0.140	-	-	0	0	
27-6	14	0.22	32.5	597	0.115	0.128	154	154	385	
4-7	7	0.20	35.8	631	0.099	0.107	65	219	548	
17-7	13	0.18	34.9	621	0.083	0.091	102	321	803	
2-8	16	0.16	33.7	604	0.069	0.076	105	426	1,065	
15-8	13	0.36	36.0	539	0.248	0.159	178	604	1,510	
28-8	13	0.27	33.8	567	0.158	0.203	228	832	2,080	
7-9	10	0.30	36.2	570	0.187	0.173	149	981	2,453	
16-10	39	0.30	31.9	573	0.187	0.187	630	1,611	4,028	
30-10	14	0.25	31.3	569	0.140	0.164	198	1,809	4,523	
14-11	15	0.22	31.1	573	0.114	0.127	164	1,973	4,933	
29-11	15	0.20	28.7	556	0.099	0.107	138	2,111	5,275	
12-12	13	0.20	27.8	554	0.099	0.099	111	2,222	5,555	
27-12-'83	15	0,20	29.2	560	0.099	0.099	128	2,350	5,875	
12-1-'84	16	0.17	25.6	537	0.076	0.088	121	2,471	6,178	
26-1	14	0.17	25.5	541	0.076	0.076	91	2,562	6,405	
8-2	13	0.16	25.5	542	0.069	0.073	81	2,643	6,608	
20-2	12	0.17	25.8	551	0.076	0.073	75	2,718	6,795	
5-3	13	0.17	27.2	571	0.076	0.076	65	2,783	6,958	
18-3	13	0.17	29.7	597	0.076	0.076	85	2,868	7,170	
3-4	17	0.17	27.8	599	0.076	0.076	111	2,979	7,448	
16-4	13	0.14	30.8	-	0.055	0.066	74	3,053	7,633	
30-4	14	0.13	30.3	604	0.049	0.052	62	3,115	7,788	
14-5	14	0.14	31.4	610	0.055	0.052	62	3,177	7,943	
27-5	13	0.13	35.4	640	0.049	0.052	58	3,235	8,088	
12-6	16	0.11	32.4	637	0.037	0.043	59	3,294	8,235	
24-6	12	0.11	32.6	641	0.037	0.037	38	3,332	8,330	
11-7	17	0.10	34.1	664	0.032	0.035	51	3,383	8.458	

Water Use of Falaj Al-Bilad (2)

Date	Term(t) (day)	Depth of Canal(h) (m)	Water Temp. (°C)	E.C (µs/cm)	Discharge* Q (m^3/s)	Average Q (m^3/s)	Water use V = txQ ($10^3 m^3$)	ΣV ($10^3 m^3$)	Water use ΣV/A(40.0 ha) (mm)	Remarks
24-7-'84	13	0.09	32.6	646	0.026	0.029	32	3,415	8,538	
9-8	16	0.09	34.7	670	0.026	0.026	35	3,450	8,625	
27-8	18	0.08	33.1	660	0.021	0.024	37	3,487	8,718	
12-9	16	0.08	29.3	638	0.021	0.021	29	3,516	8,790	
24-9	12	0.08	29.4	653	0.021	0.021	22	3,538	8,845	
9-10	15	0.08	27.6	593	0.021	0.021	27	3,565	8,912	
31-10	22	0.08	22.6	593	0.021	0.021	40	3,605	9,012	
13-11	13	0.08	22.6	543	0.021	0.021	24	3,629	9,072	
28-11	15	0.09	22.9	549	0.022	0.022	29	3,658	9,145	
13-12	15	0.16	28.5	585	0.043	0.033	43	3,701	9,252	Falaj was improved
29-12-'84	16	0.17	28.0	588	0.039	0.041	57	3,758	9,395	
15-1-'85	17	0.16	25.0	569	0.037	0.038	56	3,814	9,353	
28-1	13	0.16	26.9	582	0.037	0.037	42	3,856	9,640	
12-2	15	0.16	26.9	582	0.036	0.037	48	3,904	9,760	
26-2	14	0.16	27.4	594	0.036	0.036	44	3,948	9,870	
12-3	14	0.15	26.1	577	0.033	0.035	42	3,990	9,975	
26-3	14	0.14	29.4	602	0.026	0.030	36	4,026	10,065	
7-4	12	0.15	31.2	631	0.032	0.029	30	4,056	10,140	
23-4	16	0.17	28.8	610	0.029	0.031	43	4,099	10,248	
14-5	21	0.18	29.7	620	0.043	0.036	65	4,164	10,410	
27-5	13	0.18	30.9	621	0.042	0.043	48	4,212	10,530	
9-6	13	0.18	30.8	611	0.042	0.042	47	4,256	10,640	
29-6	20	0.18	30.8	611	0.042	0.042	73	4,332	10,830	
7-7	8	0.17	33.6	665	0.038	0.040	28	4,360	10,900	
13-8	37	0.17	33.0	660	0.038	0.038	121	4,481	11,202	

Note: * Discharge of Falaj was measured by current meter

Water Use of Falaj Al-Maisre (1)

$Q = 1.990\ (h - 0.101)^{3/2}$

Date	Term(t) (day)	Depth of Canal(h) (m)	Water Temp. (°C)	E.C (μs/cm)	Discharge* Q (m^3/s)	Average $\overline{Q}$ (m^3/s)	Water use $V = tx\overline{Q}$ (10^3m^3)	ΣV (10^3m^3)	Water use ΣV/A(131.0 ha) (mm)	Remarks
28-2-'83	-	0.44	32.0	599	0.393	-	0	0	0	
10-4	10	0.40	31.9	608	0.325	0.359	310	310	237	
20-4	10	0.44	32.0	583	0.393	0.359	310	620	473	
1-5	11	0.44	31.9	601	0.393	0.393	373	993	758	
12-5	11	0.42	31.9	608	0.359	0.376	357	1,350	1,031	
7-6	26	0.41	31.8	641	0.342	0.351	788	2,138	1,632	
21-6	14	0.40	31.9	606	0.325	0.334	404	2,542	1,940	
4-7	13	0.40	31.8	612	0.325	0.325	365	2,907	2,219	
19-7	15	0.39	30.0	616	0.309	0.317	410	3,317	2,532	
4-8	16	0.39	31.8	600	0.309	0.309	427	3,744	2,858	
15-8	11	0.40	31.9	602	0.325	0.317	301	4,045	3,088	
30-8	15	0.39	31.3	617	0.309	0.317	410	4,455	3,401	
8-9	9	0.38	30.4	611	0.293	0.301	234	4,689	3,579	
1-10	23	0.38	31.7	618	0.293	0.293	582	5,271	4,024	
18-10	17	0.37	31.7	621	0.278	0.286	420	5,691	4,344	
31-10	13	0.36	31.7	621	0.262	0.270	303	5,994	4,576	
16-11	16	0.35	31.7	627	0.247	0.255	352	6,346	4,844	
1-12	15	0.33	31.7	629	0.218	0.233	301	6,647	5,074	
13-12	12	0.31	31.7	633	0.190	0.204	211	6,858	5,235	
27-12	14	0.30	31.6	631	0.177	0.184	222	7,080	5,405	
12-1-'84	16	0.30	31.6	638	0.177	0.177	244	7,324	5,591	
26-1	14	0.30	31.6	642	0.177	0.177	214	7,538	5,754	
8-2	13	0.30	31.6	641	0.177	0.177	198	7,736	5,905	
20-2	12	0.29	31.4	646	0.164	0.171	177	7,913	6,040	
5-3	13	0.29	31.5	652	0.164	0.164	184	8,097	6,181	
18-3	13	0.30	31.4	653	0.177	0.171	192	8,289	6,327	
3-4	16	0.29	31.6	653	0.164	0.171	239	8,528	6,510	
16-4	13	0.30	31.6	-	0.177	0.171	192	8,720	6,656	
30-4	14	0.29	31.6	658	0.164	0.171	206	8,926	6,814	
14-5	14	0.29	31.6	658	0.164	0.164	198	9,124	6,965	

Water Use of Falaj Al-Maisre (2)

Date	Term(t) (day)	Depth of Canal(h) (m)	Water Temp. (°C)	E.C (μs/cm)	Discharge* Q (m^3/s)	Average $\bar{Q}$ (m^3/s)	Water use $V = tx\bar{Q}$ (10^3m^3)	ΣV (10^3m^3)	Water use ΣV/A(131.0 ha) (mm)	Remarks
28-5-'84	14	0.29	31.6	650	0.164	0.164	198	9,322	7,116	
11-6	14	0.29	31.6	669	0.164	0.164	198	9,520	7,267	
25-6	14	0.27	31.6	674	0.138	0.151	182	9,702	7,406	
11-7	16	0.27	31.6	675	0.138	0.138	190	9,892	7,551	
24-7	13	0.27	31.7	673	0.138	0.138	155	10,047	7,669	
11-8	18	0.27	31.7	670	0.138	0.138	214	10,261	7,833	
27-8	16	0.25	31.7	671	0.114	0.126	174	10,435	7,966	
12-9	16	0.25	31.6	676	0.125	0.120	166	10,601	8,092	
24-9	12	0.24	31.6	676	0.115	0.120	124	10,725	8,187	
9-10	15	0.24	31.5	676	0.115	0.115	149	10,874	8,301	
31-10	22	0.25	31.5	676	0.125	0.120	228	11,102	8,475	
12-11	12	0.24	31.5	679	0.115	0.120	124	11,226	8,569	
28-11	16	0.24	31.4	677	0.115	0.115	159	11,385	8,691	
13-12	13	0.23	31.4	675	0.111	0.113	127	11,512	8,788	
2-1-'85	20	0.23	31.3	672	0.104	0.108	187	11,699	8,931	
15-1	13	0.23	31.4	678	0.107	0.106	119	11,818	9,021	
28-1	13	0.22	31.4	678	0.099	0.103	116	11,934	9,110	
12-2	15	0.23	31.3	-	0.088	0.094	122	12,056	9,203	
26-2	14	0.22	31.4	675	0.087	0.088	106	12,162	9,284	
12-3	14	0.22	31.2	662	0.093	0.090	109	12,271	9,367	
26-3	14	0.20	31.5	682	0.092	0.088	106	12,377	9,448	
7-4	12	0.20	31.5	670	0.085	0.084	87	12,464	9,515	
22-4	15	0.20	31.5	682	0.073	0.079	102	12,566	9,592	
14-5	22	0.20	31.7	692	0.076	0.075	143	12,709	9,702	
27-5	13	0.20	31.5	689	0.079	0.078	54	12,763	9,743	
9-6	13	0.20	31.6	689	0.079	0.079	89	12,852	9,811	
29-6	20	0.20	32.1	660	0.079	0.079	137	12,989	9,915	
7-7	8	0.20	31.6	688	0.072	0.076	53	13,042	9,956	
14-8-'85	38	0.18	31.6	682	0.061	0.067	220	13,262	10,124	

Note: * Discharge of Falaj was measured by current meter

Water Use of Falaj Abu-Thalab (1)

$Q = 0.473\ (h - 0.033)^{3/2}$

Date	Term(t) (day)	Depth of Canal(h) (m)	Water Temp. (°C)	E.C (μs/cm)	Discharge Q (m^3/s)	Average $\bar{Q}$ (m^3/s)	Water use $V = t \times \bar{Q}$ ($10^3 m^3$)	ΣV ($10^3 m^3$)	Water use ΣV/A(37.0 ha) (mm)	Remarks
28-2-'83	-	0.40	32.2	505	0.105	-	0	0	0	
10-4	10	0.44	32.2	512	0.123	0.114	98	98	265	
20-4	10	0.58	32.4	498	0.191	0.157	135	233	630	
1-5	11	0.50	32.3	504	0.151	0.171	162	395	1,068	
12-5	11	0.44	32.2	480	0.123	0.137	130	525	1,419	
7-6	26	0.45	32.3	507	0.127	0.125	280	805	2,176	
21-6	14	0.44	32.3	500	0.123	0.125	151	956	2,583	
4-7	13	0.40	32.3	505	0.105	0.114	128	1,084	2,930	
19-7	15	0.40	32.3	506	0.105	0.105	136	1,220	3,297	
4-8	16	0.38	32.2	500	0.097	0.101	139	1,359	3,673	
15-8	11	0.46	32.3	502	0.132	0.115	109	1,468	3,968	
30-8	15	0.39	32.3	509	0.101	0.117	151	1,619	4,376	
8-9	9	0.39	32.3	507	0.101	0.101	78	1,697	4,586	
1-10	23	0.39	31.0	508	0.101	0.101	200	1,897	5,127	
18-10	17	0.38	32.2	507	0.097	0.099	145	2,042	5,519	
31-10	13	0.38	32.2	504	0.097	0.097	108	2,150	5,811	
16-11	16	0.37	32.0	513	0.093	0.095	131	2,281	6,165	
1-12	15	0.36	32.1	505	0.088	0.091	117	2,397	6,481	
13-12	12	0.35	32.1	507	0.084	0.086	89	2,487	6,722	
27-12	14	0.35	32.0	505	0.084	0.084	101	2,588	6,995	
12-1-'84	16	0.32	32.0	507	0.073	0.079	109	2,697	7,289	
26-1	14	0.32	31.8	507	0.073	0.073	88	2,785	7,527	
8-2	13	0.32	31.9	505	0.073	0.073	81	2,866	7,746	
20-2	12	0.28	31.9	506	0.058	0.066	68	2,934	7,930	
5-3	13	0.29	31.9	506	0.062	0.060	67	3,001	8,111	
18-3	13	0.22	31.9	505	0.038	0.050	56	3,057	8,262	
3-4	16	0.24	32.0	502	0.045	0.042	58	3,115	8,419	
16-4	13	0.23	31.1	-	0.041	0.043	48	3,163	8,549	
30-4	14	0.21	32.1	499	0.035	0.038	45	3,208	8,670	
14-5	14	0.22	32.2	498	0.038	0.037	44	3,252	8,789	

Water Use of Falaj Abu-Thalab (2)

Date	Term(t) (day)	Depth of Canal(h) (m)	Water Temp. (°C)	E.C (μs/cm)	Discharge* Q (m^3/s)	Average $\overline{Q}$ (m^3/s)	Water use $V = tx\overline{Q}$ (10^3m^3)	ΣV (10^3m^3)	Water use $\Sigma V/A$(37.0 ha) (mm)	Remarks
28-5-'84	14	0.20	32.2	-	0.032	0.035	42	3,294	8,903	
11-6	14	0.21	32.3	498	0.035	0.034	41	3,335	9,014	
25-6	14	0.16	32.2	499	0.021	0.028	33	3,368	9,103	
11-7	16	0.16	32.3	497	0.021	0.021	29	3,397	9,181	
24-7	13	0.16	32.3	498	0.021	0.021	23	3,420	9,243	
11-8	18	0.18	32.4	495	0.027	0.024	37	3,457	9,343	
27-8	16	0.21	32.4	497	0.035	0.031	42	3,499	9,457	
12-9	16	0.18	32.3	494	0.035	0.035	48	3,547	9,586	
24-9	12	0.16	32.3	490	0.029	0.032	33	3,580	9,676	
9-10	15	0.17	32.2	490	0.031	0.030	39	3,619	9,781	
31-10	22	0.16	32.1	487	0.029	0.030	57	3,676	9,935	
12-11	12	0.17	32.0	478	0.031	0.030	31	3,707	10,019	
28-11	16	0.18	32.0	479	0.034	0.033	45	3,752	10,141	
13-12-'84	15	0.17	31.9	481	0.031	0.033	43	3,795	10,257	
2-1-'85	20	0.16	31.8	480	0.025	0.028	48	3,843	10,386	
15-1	13	0.16	31.9	471	0.027	0.026	29	3,872	10,465	
28-1	13	0.16	31.9	478	0.028	0.028	31	3,903	10,549	
12-2	15	0.14	31.8	479	0.028	0.028	36	3,939	10,646	
26-2	14	0.14	31.8	479	0.025	0.027	33	3,972	10,735	
12-3	14	0.14	31.4	474	0.028	0.026	31	4,003	10,819	
26-3	14	0.14	32.1	478	0.027	0.028	34	4,037	10,911	
7-4	12	0.14	32.0	469	0.028	0.028	29	4,066	10,989	
23-4	16	0.13	32.0	476	0.024	0.026	36	4,102	11,086	
14-5	21	0.14	32.2	492	0.026	0.025	45	4,147	11,208	
27-5	13	0.14	32.2	476	0.021	0.023	26	4,173	11,278	
9-6	13	0.14	32.2	475	0.019	0.020	22	4,195	11,338	
29-5	20	0.14	32.4	472	0.021	0.020	34	4,229	11,430	
7-7	8	0.13	32.5	442	0.018	0.020	14	4,243	11,468	
14-8-'85	38	0.13	32.5	477	0.023	0.021	69	4,312	11,654	

Note: * Discharge of Falaj was measured by current meter

Water Use of Falaj Al-Kalid (1)

$Q = 0.225\ (h - 0.005)^{3/2}$

Date	Term(t) (day)	Depth of Canal(h) (m)	Water Temp. (°C)	E.C (µs/cm)	Discharge Q (m^3/s)	Average $\bar{Q}$ (m^3/s)	Water use $V = tx\bar{Q}$ (10^3m^3)	ΣV (10^3m^3)	Water use ΣV/A(11.5 ha) (mm)	Remarks
28-2-'83	-	0.20	36.0	880	0.019	-	0	0	0	
10-4	10)	*	*	*	*					
20-4	10	0.26	36.2	879	0.029	0.024	41	41	356	
1-5	11	0.26	36.4	868	0.029	0.029	27	68	591	
12-5	11	0.24	36.6	870	0.026	0.028	26	94	817	
7-6	26	0.25	37.1	867	0.027	0.028	62	156	1,357	
28-6*	21	0.20	36.9	851	0.019	0.023	41	197	1,713	
6-7*	8	0.19	37.2	876	0.018	0.019	13	210	1,826	
20-7	14	0.21	37.4	866	0.021	0.020	24	234	2,035	
4-8	15	0.22	36.7	-	0.022	0.022	28	262	2,278	
15-8	11	0.24	36.9	-	0.026	0.024	22	284	2,470	
30-8	15	0.17	36.8	853	0.015	0.021	27	311	2,704	
8-9	9	0.23	36.6	854	0.024	0.020	15	326	2,835	
1-10	23	0.25	36.7	865	0.027	0.026	51	377	3,278	
18-10	17	0.23	35.8	854	0.024	0.026	38	415	3,609	
1-11*	14	0.21	36.0	788	0.021	0.023	27	442	3,843	
16-11	15	0.21	35.7	865	0.021	0.021	27	469	4,078	
1-12	15	0.20	35.7	852	0.019	0.020	25	494	4,296	
13-12	12	0.21	35.7	855	0.021	0.020	20	514	4,470	
27-12	14	0.20	35.4	850	0.019	0.020	24	538	4,678	
12-1-'84	16	0.20	35.2	849	0.019	0.019	26	564	4,904	
26-1	14	0.19	35.4	854	0.018	0.019	22	586	5,096	
8-2	13	0.19	35.4	853	0.018	0.018	20	606	5,270	
20-2	12	0.19	35.3	854	0.018	0.018	18	624	5,426	
5-3	13	0.18	35.6	866	0.016	0.017	19	643	5,591	
18-3	13	0.19	36.1	870	0.018	0.017	19	662	5,757	
3-4	16	0.12	36.7	866	0.009	0.014	19	681	5,922	
16-4	13	0.17	36.2	-	0.015	0.012	13	694	6,035	
30-4	14	0.17	36.1	872	0.015	0.015	18	712	6,191	
14-5	14	0.17	36.2	872	0.015	0.015	18	730	6,348	

Water Use of Falaj Al-Kalid (2) $Q = 0.225\ (h - 0.005)^{3/2}$

Date	Term(t) (day)	Depth of Canal(h) (m)	Water Temp. (°C)	E.C (μs/cm)	Discharge Q (m^3/s)	Average $\bar{Q}$ (m^3/s)	Water use $V = t \times \bar{Q}$ ($10^3 m^3$)	ΣV ($10^3 m^3$)	Water use $\Sigma V/A$(11.5 ha) (mm)	Remarks
28-5-'84	14	0.20	37.7	880	0.019	0.017	20	750	6,522	
11-6	14	0.20	37.2	884	0.019	0.019	22	772	6,713	
25-6	14	0.16	37.0	887	0.014	0.017	20	792	6,887	
11-7	16	0.18	36.8	900	0.016	0.015	20	812	7,061	
24-7	13	0.19	37.0	896	0.018	0.017	19	831	7,226	
11-8	18	0.15	37.1	897	0.012	0.015	26	857	7,452	
27-8	16	0.18	36.9	895	0.016	0.014	19	876	7,617	
12-9	16	0.18	36.7	934	0.016	0.016	22	898	7,809	
24-9	12	0.18	36.8	935	0.016	0.016	17	915	7,957	
9-10	15	0.18	36.6	934	0.016	0.016	21	936	8,139	
31-10	22	0.15	35.3	911	0.012	0.014	27	963	8,374	
12-11	12	0.16	35.9	890	0.014	0.013	13	976	8,487	
28-11	16	0.14	35.5	890	0.011	0.013	18	994	8,643	
13-12-'84	15	0.14	35.5	889	0.011	0.011	14	1,008	8,765	
2-1-'85	20	0.14	35.2	891	0.011	0.011	19	1,027	8,930	
15-1	13	0.16	35.5	884	0.014	0.013	15	1,042	9,061	
28-1	13	0.16	35.4	884	0.014	0.014	16	1,058	9,200	
12-2	15	0.16	35.3	-	0.014	0.014	18	1,076	9,356	
26-2	14	0.16	35.2	876	0.014	0.014	17	1,093	9,504	
12-3	14	0.17	35.5	879	0.015	0.015	18	1,111	9,661	
26-3	14	0.14	36.0	893	0.011	0.013	16	1,127	9,800	
7-4	12	0.16	36.0	896	0.014	0.013	13	1,140	9,913	
23-4	16	0.16	36.3	831	0.014	0.014	19	1,159	10,078	
14-5	21	0.14	36.7	913	0.011	0.013	24	1,183	10,287	
27-5	13	0.15	36.6	908	0.012	0.012	13	1,196	10,400	
9-6	13	0.14	36.5	899	0.011	0.012	13	1,209	10,513	
29-6	20	0.14	36.4	899	0.011	0.011	19	1,228	10,678	
14-8	46	0.15	36.5	900	0.012	0.012	48	1,276	11,096	

Water Use of Falaj Hazam (1) $Q = 1.619\ (h - 0.001)^{3/2}$

Date	Term(t) (day)	Depth of Canal(h) (m)	Water Temp. (°C)	E.C (μs/cm)	Discharge Q (m^3/s)	Average $\overline{Q}$ (m^3/s)	Water use $V = tx\overline{Q}$ ($10^3 m^3$)	ΣV ($10^3 m^3$)	Water use ΣV/A(33.4 ha) (mm)	Remarks
28-2-'83	-	0.63 (0.53)	30.9	1,098	0.623	-	0	0	0	
10-4	10	0.64 (0.54)	30.4	1,073	0.641	0.632	546	546	1,635	
20-4	10	0.65 (0.55)	30.5	1,053	0.659	0.650	561	1,107	3,314	
1-5	11	0.64 (0.54)	30.7	1,053	0.641	0.650	617	1,724	5,162	
12-5	11	0.64 (0.54)	30.7	1,051	0.641	0.666	632	2,356	7,054	
6-6	25	0.62 (0.52)	30.5	1,044	0.605	0.623	1,345	3,701	11,081	
21-6	15	0.60 (0.50)	30.5	1,020	0.571	0.588	762	4,463	13,361	
4-7	13	0.59 (0.49)	30.6	1,025	0.554	0.563	632	5,095	15,254	
19-7	15	0.57 (0.47)	30.8	1,017	0.520	0.533	690	5,785	17,320	
4-8	16	0.54 (0.44)	30.1	1,000	0.471	0.496	685	6,470	19,371	
15-8	11	0.54 (0.44)	30.8	1,019	0.471	0.471	447	6,917	20,703	
30-8	15	0.53 (0.43)	30.9	1,023	0.455	0.463	600	7,517	22,500	
8-9	9	0.53 (0.43)	31.1	1,024	0.455	0.455	353	7,870	23,563	
1-10	23	0.53 (0.43)	31.0	1,030	0.455	0.455	904	8,774	26,269	
18-10	17	0.53 (0.43)	31.1	1,018	0.455	0.455	668	9,442	28,269	
31-10	13	0.53 (0.43)	31.0	1,028	0.455	0.455	511	9,953	29,799	
16-11	16	0.53 (0.43)	31.0	1,024	0.455	0.455	628	10,581	31,680	
1-12	15	0.53 (0.43)	31.0	1,000	0.455	0.455	589	11,170	33,443	
13-12	12	0.52 (0.42)	31.0	1,003	0.439	0.447	463	11,633	34,829	
27-12	14	0.50 (0.40)	30.9	1,017	0.408	0.424	512	12,145	36,362	
12-1-'84	16	0.50 (0.40)	30.8	962	0.408	0.408	564	12,709	38,051	
26-1	14	0.49 (0.39)	30.7	1,011	0.393	0.401	485	13,194	39,503	
8-2	13	0.48 (0.38)	30.7	1,008	0.378	0.386	433	13,627	40,799	
20-2	12	0.48 (0.38)	29.6	993	0.378	0.378	391	14,018	41,970	
5-3	13	0.48 (0.38)	30.6	997	0.378	0.378	424	14,442	43,240	
18-3	13	0.46 (0.36)	30.7	962	0.348	0.363	404	14,846	44,449	
3-4	16	0.45 (0.35)	30.7	993	0.334	0.341	471	15,317	45,859	
16-4	13	0.43 (0.33)	30.7	-	0.306	0.320	359	15,676	46,934	
30-4	14	0.42 (0.32)	30.7	987	0.292	0.299	361	16,037	48,015	
14-5	14	0.52 (0.42)	30.8	978	0.439	0.366	442	16,479	49,338	

Water Use of Falaj Hazam (2)

Date	Term(t) (day)	Depth of Canal(h) (m)	Water Temp. (°C)	E.C (μs/cm)	Discharge* Q (m^3/s)	Average $\overline{Q}$ (m^3/s)	Water use $V = tx\overline{Q}$ ($10^3 m^3$)	ΣV ($10^3 m^3$)	Water use $\Sigma V/A$(33.4 ha) (mm)	Remarks
28-5-'84	14	0.51 (0.41)	30.7	-	0.423	0.431	521	17,000	50,898	
11-6	14	0.49 (0.39)	30.8	983	0.393	0.408	493	17,493	52,374	
25-6	14	0.34 (0.24)	30.8	985	0.189	0.291	351	17,844	53,425	
11-7	16	0.34 (0.24)	30.9	983	0.189	0.189	261	18,105	54,206	
24-7	13	0.33 (0.23)	31.0	988	0.177	0.183	205	18,310	54,820	
11-8	18	0.33 (0.23)	30.9	973	0.177	0.177	275	18,585	55,644	
27-8	16	0.32 (0.22)	31.0	965	0.166	0.172	237	18,822	56,353	
12-9	16	0.31 (0.21)	30.9	975	0.125	0.146	202	19,024	56,958	
24-9	12	0.32 (0.20)	30.7	964	0.110	0.118	122	19,146	57,323	
9-10	15	0.30 (0.20)	30.5	958	0.110	0.110	142	19,288	57,749	
31-10	22	0.28 (0.18)	30.3	935	0.085	0.098	186	19,474	58,305	
12-11	12	0.28 (0.18)	30.3	930	0.085	0.085	88	19,562	58,569	
28-11	16	0.26 (0.16)	30.0	936	0.062	0.074	102	19,664	58,874	
13-12-'84	15	0.27 (0.17)	30.4	902	0.067	0.065	84	19,748	59,126	
2-1-'85	20	0.26 (0.16)	29.7	921	0.070	0.069	119	19,867	59,482	
15-1	13	0.26 (0.16)	29.9	917	0.066	0.068	76	19,943	59,710	
29-1	14	0.26 (0.16)	29.9	918	0.064	0.065	79	20.022	59,946	
12-2	14	0.25 (0.15)	29.7	985	0.058	0.061	74	20.096	60,167	
26-2	14	0.26 (0.16)	29.8	917	0.064	0.061	74	20,170	60,389	
12-3	14	0.26 (0.16)	29.6	917	0.055	0.060	73	20,243	60,608	
26-3	14	0.24	30.2	917	0.033	0.044	53	20,296	60,766	Staff gage was changed
7-4	12	0.24	30.3	874	0.028	0.031	32	20,328	60,862	
23-4	16	0.24	30.2	903	0.023	0.026	36	20,364	60,970	
14-5	21	0.24	30.5	918	0.023	0.023	42	20,406	61,096	
27-5	13	0.24	30.4	899	0.020	0.022	25	20,431	61,171	
9-6	13	0.23	30.7	888	0.022	0.021	24	20,455	61,243	
29-6	20	0.22	31.1	850	0.019	0.021	36	20,491	61,350	
7-7	8	0.22	31.1	888	0.018	0.019	13	20,504	61,389	
13-8	37	0.22	31.1	875	0.014	0.016	51	20,555	61,542	

Note: ( ) Reading of staff gage (m) * Discharge of Falaj are measured by current meter

Water Use of Falaj Awabi (Main Canal - #1) (1)

$Q = 0.526\ (h - 0.012)^{3/2}$

Date	Term(t) (day)	Depth of Canal(h) (m)	Water Temp. (°C)	E.C (μs/cm)	Discharge Q (m^3/s)	Average $\bar{Q}$ (m^3/s)	Water use $V = tx\bar{Q}$ (10^3m^3)	ΣV (10^3m^3)	Water use ΣV/A(88.4 ha) (mm)	Remarks
28-2-'83	-	0.53	31.0	638	0.196	-				
10-4	10	0.55	30.9	642	0.208	0	0	0	0	
20-4	10	0.60	30.9	622	0.237	0.223	192	192	217	
1-5	11	0.36	30.9	636	0.108					
12-5	11	0.40	31.2	640	0.127					
7-6	26	0.30	30.9	640	0.081					
21-6	14	0.50	31.2	632	0.179	0.208	1,114	1,306	1,477	
5-7	14	0.47	31.4	644	0.163	0.171	206	1,512	1,710	
19-7	14	0.27	30.0	635	0.069					
4-8	16	0.47	31.0	650	0.163	0.163	422	1,934	2,188	
14-8	10	0.37	31.0	619	0.113					
30-8	16	0.50	31.1	634	0.179	0.171	384	2,318	2,622	
8-9	9	0.50	31.0	638	0.179	0.179	139	2,457	2,779	
1-10	23	0.51	30.9	633	0.185	0.182	361	2,818	3,188	
18-10	17	0.30	31.0	633	0.081					
31-10	13	0.51	30.7	640	0.185	0.185	479	3,297	3,730	
16-11	16	0.50	30.8	635	0.179	0.182	251	3,548	4,014	
1-12	15	0.50	30.7	636	0.179	0.179	231	3,779	4,275	
13-12	12	0.29	30.8	636	0.077					
27-12	14	0.49	30.5	623	0.173	0.176	395	4,174	4,722	
12-1-'84	16	0.49	30.6	634	0.173	0.173	239	4,413	4,992	
26-1	14	0.48	30.6	635	0.168	0.170	205	4,618	5,224	
8-2	13	0.28	30.7	636	0.073					
20-2	12	0.28	30.5	636	0.073					
5-3	13	0.42	30.6	638	0.137	0.152	499	5,117	5,788	
18-3	13	0.21	30.7	637	0.046					
3-4	16	0.35	30.8	631	0.103	0.120	300	5,417	6,218	
16-4	13	0.40	30.8	-	0.127	0.115	129	5,546	6,274	
30-4	14	0.41	30.7	634	0.132	0.129	156	5,702	5,450	
14-5	14	0.23	31.0	663	0.054					

Water Use of Falaj Awabi (Main Canal - #1) (2) $Q = 0.526\ (h - 0.012)^{3/2}$

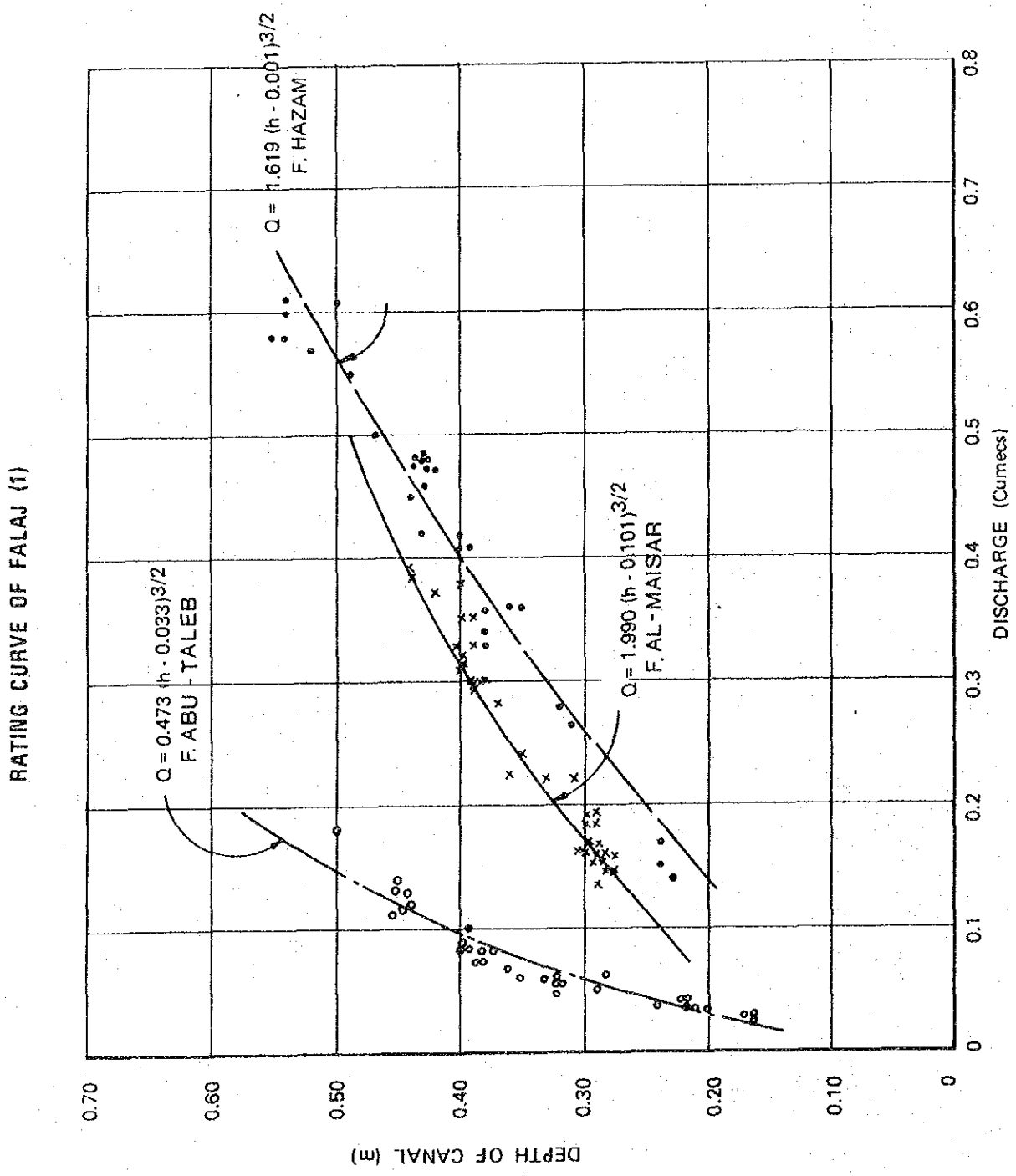
Date	Term(t) (day)	Depth of Canal(h) (m)	Water Temp. (°C)	E.C (μs/cm)	Discharge Q (m^3/s)	Average $\bar{Q}$ (m^3/s)	Water use $V = tx\bar{Q}$ (10^3m^3)	ΣV (10^3m^3)	Water use $\Sigma V/A$(88.4 ha) (mm)	Remarks
28-5-'84	14	0.37	30.8	-	0.113	0.122	295	5,997	6,784	
11-6	14	0.22	30.8	635	0.050					
25-6	14	0.21	30.9	639	0.046					
11-7	16	0.21	30.9	636	0.046					
24-7	13	0.33	30.9	637	0.094	0.103	507	6,504	7,357	
11-8	18	0.20	31.0	629	0.043					
27-8	16	0.49	31.2	621	0.173	0.134	394	6,898	7,803	
12-9	16	0.36	30.9	634	0.108	0.141	195	7,093	8,024	
24-9	12	0.33	30.8	633	0.094	0.101	105	7,198	8,143	
9-10	15	0.32	30.7	634	0.090	0.092	119	7,317	8,277	
31-10	22	0.32	30.7	634	0.090	0.090	171	7,488	8,471	
12-11	12	-	30.6	630	-					
28-11	16	0.27	30.6	630	0.069	0.080	194	7,682	8,690	
13-12	15	0.28	30.6	598	0.073	0.071	92	7,774	8,794	
2-1-'85	20	0.17	30.2	625	0.033					
15-1	13	0.17	30.4	624	0.033					
28-1	13	0.28	30.3	628	0.073	0.073	290	8,064	9,122	
12-2	15	0.27	30.1	-	0.069	0.071	92	8,156	9,226	
26-2	14	0.16	30.3	622	0.030					
12-3	14	0.17	30.1	621	0.033					
26-3	14	0.26	30.5	624	0.065	0.067	243	8,399	9,501	
7-4	12	0.26	30.5	624	0.065	0.065	67	8,466	9,577	
23-4	16	0.15	30.5	620	0.027					
14-5	21	0.16	30.7	632	0.030					
27-5	13	0.25	30.7	622	0.061	0.063	272	8,738	9,885	
9-6	13	0.16	30.8	626	0.030					
29-6	20	-	31.0	608	-					
7-7	8	0.16	31.0	608	0.030					
14-8-'85	38	0.16	30.9	620	0.030					

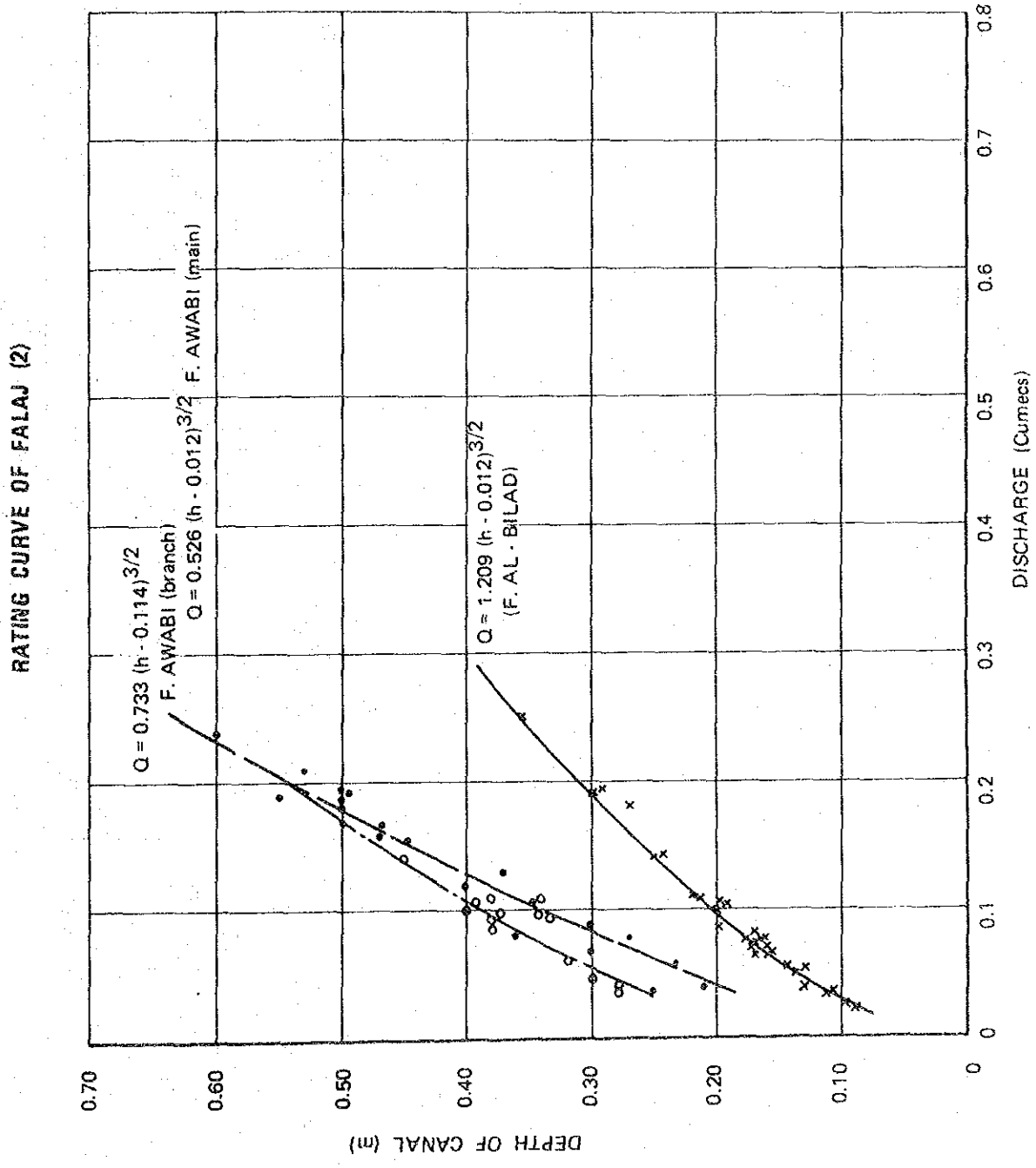
Water Use of Falaj Awabi (Branch Canal - #2) (1) $Q = 0.733\ (h-0.114)^{3/2}$

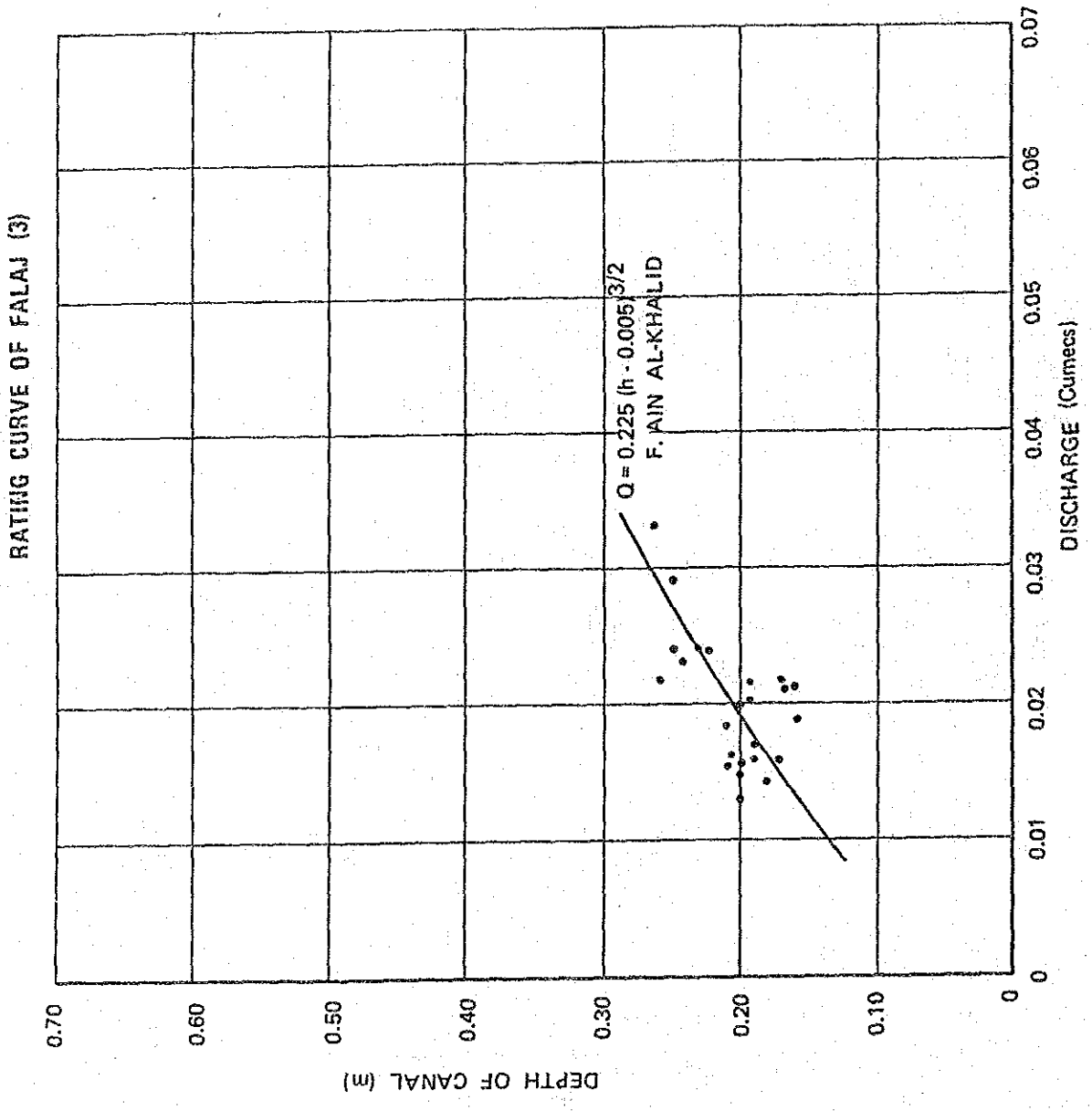
Date	Term(t) (day)	Depth of Canal(h) (m)	Water Temp. (°C)	E.C (us/cm)	Discharge Q (m^3/s)	Average $\bar{Q}$ (m^3/s)	Water use $V = t \times \bar{Q}$ ($10^3 m^3$)	ΣV ($10^3 m^3$)	Water use $\Sigma V/A$(28.4 ha) (mm)	Remarks
28-2-'83	-	0.48	30.8	636	0.162					
10-4	10	-	-	-	-					
20-4	10	-	-	-	-					
1-5	11	0.40	30.9	636	0.112					
12-5	11	0.33	31.2	640	0.074					
7-6	26	0.37	30.9	640	0.095					
21-6	14	-	-	-	-					
4-7	13	-	-	-	-					
19-7	15	0.34	30.0	635	0.079					
4-8	16	-	-	-	-					
15-8	11	0.45	31.0	619	0.143					
30-8	15	-	-	-	-					
8-9	9	-	-	-	-					
1-10	23	-	-	-	-					
18-10	17	0.38	31.0	633	0.101					
31-10	13	-	-	-	-					
16-11	16	-	-	-	-					
1-12	15	-	-	-	-					
13-12	12	0.39	30.8	636	0.114					
27-12	14	-	-	-	-					
12-1-'84	16	-	-	-	-					
26-1	14	-	-	-	-					
8-2	13	0.38	30.7	637	0.101					
20-2	12	0.38	30.5	636	0.101					
5-3	13	-	-	-	-					
18-3	13	0.34	30.7	638	0.079					
3-4	16	-	-	-	-					
16-4	13	-	-	-	-					
30-4	14	-	-	-	-					
14-5	14	0.32	31.0	663	0.069					

Water Use of Falaj Awabi (Branch Canal - #2) (2) $Q = 0.733\ (h-0.114)^{3/2}$

Date	Term(t) (day)	Depth of Canal(h) (m)	Water Temp. (°C)	E.C (μs/cm)	Discharge Q (m^3/s)	Average $\bar{Q}$ (m^3/s)	Water use $V = tx\bar{Q}$ (10^3m^3)	ΣV (10^3m^3)	Water use ΣV/A(28.4 ha) (mm)	Remarks
28-5-'84	14	-	-	-	-					
11-6	14	0.30	30.8	635	0.059					
25-6	14	0.28	30.9	639	0.050					
11-7	16	0.28	30.9	636	0.050					
24-7	13	-	-	-	-					
11-8	18	0.28	31.0	629	0.050					
27-8	16	-	-	-	-					
12-9	16	-	-	-	-					
24-9	12	-	-	-	-					
9-10	15	-	-	-	-					
31-10	22	-	-	-	-					
12-11	12	0.29	30.6	630	0.054					
28-11	16	-	-	-	-					
13-12	15	-	-	-	-					
2-1-'85	20	0.25	30.2	625	0.037					
15-1	13	0.25	30.4	624	0.037					
28-1	13	-	-	-	-					
12-2	15	-	-	-	-					
26-2	14	0.24	30.3	622	0.033					
12-3	14	0.24	30.1	621	0.033					
26-3	14	-	-	-	-					
7-4	12	-	-	-	-					
22-4	15	0.24	30.5	620	0.033					
14-5	22	0.24	30.7	632	0.033					
27-5	13	-	-	-	-					
9-6	13	0.23	30.8	626	0.029					
29-6	20	-	31.0	608	-					
7-7	8	0.29	31.8	608	0.054					
14-8-'85	38	0.23	30.9	620	0.029					


RATING CURVE OF FALAJ (1)
Q = 0.473 (h - 0.033)3/2
F. ABU - TALEB
Q = 1.619 (h - 0.001)3/2
F. HAZAM
Q = 1.990 (h - 0.101)3/2
F. AL - MAISAR
DEPTH OF CANAL (m)
DISCHARGE (Cumecs)
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8


RATING CURVE OF FALAJ (2)
Q = 0.733 (h - 0.114)^3/2
F. AWABI (branch)
Q = 0.526 (h - 0.012)^3/2 F. AWABI (main)
Q = 1.209 (h - 0.012)^3/2
(F. AL - BILAD)
DEPTH OF CANAL (m)
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
DISCHARGE (Cumecs)


RATING CURVE OF FALAJ (3)
Q = 0.225 (h - 0.005)3/2
F. AIN AL-KHALID
DEPTH OF CANAL (m)
DISCHARGE (Cumecs)
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07