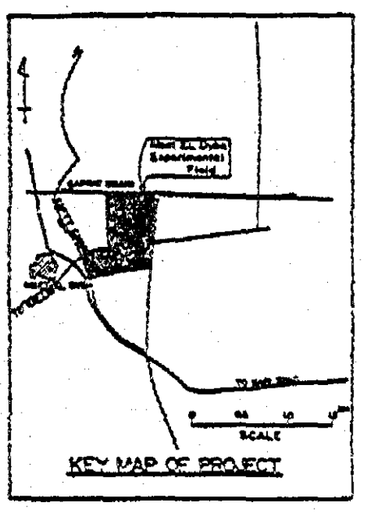


LEGEND

- FARM ROAD
- IRRIGATION DITCH
- DRAINAGE DITCH
- FARM INLET
- FARM OUTLET
- FARM LOT ENTRANCE
- INTAKE
- CHECK STRUCTURE
- WASTE WAY
- DRAIN CULVERT
- IRRIGATION CULVERT
- BOUNDARY OF LOT
- ① NUMBER OF LOT

GAFRIS DRAIN
BLOCK-D
BLOCK-C
BLOCK-B
BLOCK-A
FARM ROAD
IRRIGATION DITCH
DRAINAGE DITCH
BUILDING SITE
SAFTY CANAL
SCALE
〔赤斜線の部分 栽培部担当圃場〕

THE RICE MECHANIZATION PRO (RMP)	
GENERAL PLAN OF MEET EL DYBA EXPERMENTAL	
DWG NO. RMP-M-	SCALE
JAPAN INTERNATIONAL COOPERATION (JICA)	

第Ⅳ章　研修・演示部報告

第Ⅳ章　研修・演示部報告

第１節　研修演示部発足の経緯と活動方針

当計画に携わる日本人専門家は５名であるが，Ｒ／Ｄに基づいて農業機械専門家は２名となっている。1名（木村安弘氏）は先発隊として1981年12月に着任し，「農業機械部」を組織し，供与機材の中農業機械をテストし，改良等を施し，活動を続けてきた。もう１名の機械専門家（菅原清吉氏）は1983年３月着任したが，「機械化」を指向してソフト面を担当して頂くことにした。即ち「農業機械部」（ハード）でテストされ得られた結果をふまえて，ナイル・デルタにおける各種各様の立地条件に合わせて「米作機械化」が展開することをねらう応用部門として「研修・演示部」が本年度から新に発足したのである。

当部は，栽培課員５名，機械課員３名，日本人担当専門家１名というメンバーが当初の構成であった。その後，業務の拡大と共に1984年３月現在において栽培課員８名，機械課員３名（内１名はＫ・Ｆ県へ転勤）に増加している。Ｒ・Ｍ・Ｐの試験の成果を訓練業務，デモンストレーション等を通じて技術伝播を主業務とする当部の性格から発足当初よりＲ・Ｍ・Ｐ活動の徹底理解のため，部内検討・打合わせを部の特徴として，詳細な技術的な検討を混えて継続して行っている。当部員が訓練及びデモンストレーション活動への講師となる性格上，部員間の見解の相異は，訓練，デモンストレーション活動において，混乱を生じるため，部員相互間の統一理解，見解の必要から部内検討会が当部の日常業務になっている。又，Ｋ・Ｆ県における調査研究活動，およびその中から生じるフィードバックを対象とするアプライドトライアルの実施，部落調査，訓練業務の拡大等，今後，部として人的・質的向上が望まれる。

第２節　1983年度における業務活動内容

次に掲げたバーチャートに示したように，本年度は当部職員を通してカフル・エル・シェーク県内各地の立地条件，営農事情，土壌サンプル等に関する情報収集に努める一方，それらの調査研究結果をアラビア語にまとめ，リポート及びテキストの作成に部のエネルギーを結集した。

また，カフル・エル・シェーク県職員（普及員または関連吏員）を対照に研修会を連続して開催した。

1983年度研修演示部業務活動内容

年月 / 業務活動項目	年 1983 3月	4	5	6	7	8	9	10	11	12	年 1984 1	2	3	備考
K・F県への栽培，機械更員訓練実施														
K・F県への調査研究活動														
K・F県調査研究活動報告書作成（テキスト作成）														
トライアル実施														
現場機械関係職員への訓練実施（田植機）														
訓練資料作成 訓練実施（177名）分析														
部落調査														
来年度計画、トライアル設計														当部トライアル活動計画、ジョイントミーティング資料参照
土壌サンプルの収集														

1. 調査研究活動分担，K・F県対象

総括業務担当

Mohamed HAMAD

Fitu HISEN

FUWA, MOTOBIS 郡担当

栽培 Fatihi ALNEMUL

Mohansen GOMA （K・F県農業局職員，当部臨時スタッフ）

機械 Mahals BAYUMI（ 〃 ）

SIDI SALEM 郡担当

栽培 Essam MOHAMED

機械 Mohamed NEIM

DISOUK郡担当

栽培 Nour SALEH

機械 Sayed KHANEM

KALIN 郡担当

栽培 Mohamad YUSEF

機械 Asar Mohamad ASAR

KAFR EL SHEIK郡担当

栽培 Fatihi ALNEMUL

Faiz KEDL （K・F県農業局職員、当部臨時スタッフ）

Abudul FATTA（ 〃 ）

機械 Ebrahim YUSEF

HAMOUL BIALA 郡担当

栽培 Arah AID

機械 Mohamad SIREIMAN

（K・F県農業局職員，当部臨時スタッフ）

第3節 カフル・エル・シェーク県におけるローカルプロジェクトに対する助言・指導・及び「米作機械化」に関する現地情報の収集

1983年の稲作シーズンには，エジプト農業省の方針により，RMPとは別個に，ダカレア県とカフル・エル・シェーク県の両県に於て，機械化田植のローカル・プロジェクトが実施された。RMPとしては，それらのローカル・プロジェクトにインボルブされることを避けながら，しかも地元で行われる試行の好機を逃さずに，RMP研修生や当部職員のネットワークにより，間接的に助言指導を施し，同時に「米作機械化」を現地で実施する場合に起る諸々の問題点を把握した。当部スタッフ及び臨時スタッフを含め，前節にのべた郡別担当者を決め，育苗から機械田植まで綿密な調査研究活動を行った。この活動についての詳細な報告書はフィードバックを対象とするトライアルレポートも含めてすでに添付資料①の通り報告済であるのでここでは割愛する（「テクニカルレポート，育苗と機械移植について」参照）。この報告書は当部の執筆，編集（アラビア語版）によるものである。K・F県稲作デモンストレーションを今後共成功裡に遂行するためには，下記の項目が重要になってくると思われる。即ち，①育苗技術等に関する理解の徹底及び作業精度の向上，②作業スケジュールの確立，③除草問題の解決，④施肥技術の伝播（元肥，追肥割合，時期 ），⑤部品，育苗 薬剤等の導入，⑥新品種の導

入（畜収，耐病害，耐倒伏性品種），⑦ポストハーベスト（刈取を含む）の機械化，⑧塩基性土壌の対策，⑨直播の検討。この中で特に田植機械化に限定して言えば，(1)立枯病対策，(2)除草，肥培管理，が増収を期す上で重要である。

(1)の立枯病について；K・F県では全域にその発生をみている。特にピシューム菌によると思われる立枯病は5月下旬以後からその発生は増大する傾向にある。ほとんどが播種後催芽のための箱積中に発生し円形茶褐色の病斑を呈し，緑化床設置後枯死し丸禿状となる。これは苗箱への灌水時，タチガレン1,000倍液の灌注により予防が可能であった。（タチガレン使用によるピシューム菌によると思われる立枯病の予病はその効果が絶大である）又，リゾプス菌と思われる立枯病が2ケ所に発生があった。末端水路の停滞水への浸種，床土へのワラ等の混入個所になっている。土壌伝染性病害は，その条件が整えば大被害を及ぼす危険もあり，立枯病対策薬剤，タチガレン，ダコニールの早急な導入対策が育苗の植付から増収を期す意味では大切である。又，立枯病菌の特徴の理解から過湿防止，Pre-germinationはハト胸状態まで，長い催芽はそれだけ菌の浸入を助け立枯病の発生が多くなる（日本の最新データー）。温度管理等については，現行方法の改善方策も含めて検討する必要があると思われる。

この他，苗箱用床土が直接原因と思われる苗の発芽，成育障害の個所もあった。これは播種後発芽のための箱積中においても苗の成育がほとんどなく，根はその先端が湾曲肥大し，伸長を停止するという特徴的な症状を呈する。このような苗の成育障害の苗代個所は，イリゲイションキャナルの底土利用の苗代地に多く発生をみた。それもシデサルム郡に多くの発生をみている。土壌専門家，清野馨氏によればキャナル底土は，Cl^-イオンが有離状態にあり，Cl^-イオンによる苗の成育障害と思われるという指摘がある。箱育苗にイリゲイションキャナルの底土使用という発想は一般に粘質土が多いことから田植機の植付爪，プッシュロッドへの床土の付着の防止（砂分が多い）と土壌細菌が畑土壌より少ないという期待感からのものであった。現在（1983年）すでに植付爪プッシュロッドへの苗床土付着（相当な粘着土壌床土使用では）の問題は機械的に改良済であり，床土の粘質土壌による爪プッシュロッドから起因する植付ロスは問題にならない。（爪はY社NBタイプ，プッシュロッドはスプリング方式）農家利益の増大のために機械にまつわる経費の節減は大切な要素である。この点については，現行方法も含めて常に見直しが必要である。低コスト稲作のために，育苗コストの軽減という意味から当部としては原則としてイリゲイションキャナルの底土は，リコマンドしない方針をとることにしている。立枯病対策，健苗の育成のためにも苗代個所土壌，環境のチェックが必要である。

(1) 除草，肥培管理について

機械化稚苗移植では慣行法と比して，苗の小さいことからくる雑草対策は増収を期す上で重要な項目となる。K・F県での調査研究活動の考察から言えば，当地の水田雑草の主体はカヤツリ草科系（CYPERUS）とヒエ系（ECHINOCHOLA）に大別できる。特にカヤツリ草系の雑草は耕起以前からの繁茂もあり，耕起代掻の雑な作業から，そのまま水田で生

育するケースもある。雑草による減収割合の明確な把握および除草剤による除草効果，その経費等については，今後の課題であるが，現状の機械化デモンストレーション地域を除いてランダム植付けが行われており，ロータリーウィダー等の使用にはいまだ困難がある。手取り除草及び除草剤（サターンS）による除草が行われているが，まだ全体地域に及んでいない。特に大農家の水田除草はほとんど行っていない傾向にあるのが現状である。機械化稚苗移植は苗の小さい時に雑草との競合をさけることが増収のポイントになる。就労人口の減少により農村地帯に働いても労働の集合が難しくなって来ている状況を考慮すれば雑草対策は除草剤の使用が望しい。現在，使用しているサターンSを含めて特に前述のカヤツリグサ科系雑草，ヒエ系に有効と言われる，下記の除草剤のトライアルが必要である。

マーシェット（MACHETE），サンバード（SANBIRD），バサグランSM（BASAGRAN SM），ロンスター（RONSTAR），M・O，パウナックスM（PAUNAKKUS M），スタム（STAM F-35），クサカリン（KUSAKARIN）。

又，現在一般的に行われている施肥方法，元肥全量施肥についてもアルカリ土壌（pH8前後）という立地条件からくる肥料の有効性の見地から，元肥の種別，量，追肥の時期，肥料の種類,量,追肥の回数については今後十分な検討が必要になると考えられる。今年度K・F県実施，田植機械化デモンストレーション地域の調査によれば（栽培部門調査実施）追肥効果は明確収量増に結びついている。K・F県の活動から考察すれば，機械化稚苗移植を成功裡に行う為の急務として，(1)立枯病対策，(2)除草対策，肥培管理について薬剤等の導入とその技術の伝播も含めて早急な対応が必要である。

第4節　研　修　訓　練

表1は1983年12月15日～1984年2月23日まで行った，K・F県の再訓練生，郡別，業種別リストである。再訓練生は過去すでに当R・M・Pでの一週間の基礎訓練を終了し，今年度，K・F県が実施した田植機械化デモンストレーション現場担当者達である。育苗からはじまる機械化田植，格納までの一連の作業についての当部が行った現場調査によっては，それらの技術の定着には再度の反復訓練の必要を感じて来た。再訓練を施すにあたり，できるだけ，K・F県の実情に合わせたテキストの作成に心がけて来た。又，訓練業務のスムーズな運営のために，当部スタッフを主体として知識及び技術レベルの向上を重要事項として進めて来た。講師となる当部スタッフと再訓練生との間に明確な知識及び技術レベルの差をもたせること，これらの差が訓練業務を円滑に推進していく上での留意すべき重要ポイントになると考えている。

表1　K・F県，郡別，業種別再訓練者数

自 1983 年12月15日，至 1984 年 2 月23日

K・F県郡名	栽培部員	機械部員	合　計
1. カリン	12	6	18
2. ドゥスーク	16	14	30
3. シデサルム	9	12	21
4. カフルエルシェイク	24	10	34
5. ベアラ	13	5	18
6. モトーバス	14	9	23
7. ハモール	5	6	11
8. フーアー	6	3	9
9. 全郡機械責任者	—	13	13
計	99	78	177

表2　K・F 県吏員再訓練用カリキュラム

自 1983 年12月15日～ 1984 年 2 月23日

訓練日	時　間　割	講　師　名	訓　練　内　容　項　目
第1日	9:00 ～ 10:00	MOH	開講式，オリエンテイション，訓練前試験
	10:30 ～ 12:00	NOUR	農業機械の必要性について
	12:30 ～ 2:00	ESSAM	種子選別，浸種，催芽について
第2日	9:30 ～ 11:00	FITTOH	箱育苗準備，緑化床準備
	11:30 ～ 12:00	ALAA	床土，床土の箱入，播種，灌漑について
	12:30 ～ 2:00	栽培部門	肥培管理について
第3日	9:30 ～ 11:00	M・YUSEF	播種量，苗，植付本数について
	11:30 ～ 12:30	MOHAMAD	本田植付準備について
	1:00 ～ 2:00	FATIHI	稲の病害虫について(特に立枯病に関する説明)
第4日	9:30 ～ 11:00	E・YUSEF	本田植付準備について
			田植機操作，植付方法について
	11:30 ～ 1:30	〃	田植機の各部機能調整について
第5日	9:00 ～ 11:00	ASAR	田植機のメンテナンス
	11:30 ～ 1:30	NEIM	田植機の故障・原因・対策について(K・F県調査より)
第6日	9:00 ～ 11:00	機械部門	田植機の植付経費，機械費について
			田植機の格納について
	11:30 ～ 1:00	当部全員	最終試験，アンケート調査，閉講式

RMP・トレーニング部　1983年12月

このような経緯のもとに下記の4種の訓練用テキストを使用している。

1. テクニカルレポート「育苗と機械移植について」（当部作成）
2. 立枯病パンフレット「稲，箱育苗の病害とその防除」
   種子伝染性病害と土壌伝染性病害，農山漁村文化協会編をアラビア語版（当部訳）に作成
3. 稲の肥培管理について（栽培部作成）
   ∴栽培部作成
4. 田植機について（郡機械責任者用，当部作成）

再訓練を開始するにあたり，技術定着度把握のため，育苗から田植機格納までに亘る一連の作業に関する試験問題100問*を設け受験させた。この試験は，訓練終了後再度実施し訓練効果測定の一つの指針としている。表2は訓練カリキュラムである。これは育苗の作業順序を追い，作成している。今回の再訓練は訓練生がすでに各個人100フェダン前後の機械化田植の現場経験を持っていることから，現場実習をほとんど行わず，教室において，テキスト，スライド等を使い，詳細な技術的説明を主体にして，訓練を実施した。図1と2.3.4図は訓練前・訓練後の100問の試験結果の分布である。これによれば全体的なレベルアップは明確であるが，再訓練生にとっては，機械化田植に関連する新技術，播種量と植付本数等の関係，植付本数・株数の調整，及び育苗とpH，EC等について，その理解度は他項目と比していまだ低いレベルにある。又，訓練前の試験結果のレベルは，郡内での田植機械化連絡会議を続行していた方が，その育苗，田植結果と同様，郡内連絡会議をしていない方よりも高い。これは，訓練の終了日に行った最終10項目筆記試験結果には明確に出ている。

田植機械化について期間中に郡内連絡会議を持った郡

平均点	栽培部員	79.79
	機械 〃	70.16
	偏差値SV=	7.29

連絡会議を持たなかった郡

平均点	栽培部員	59.75
	機械 〃	40.33
	偏差値SV=	20.69

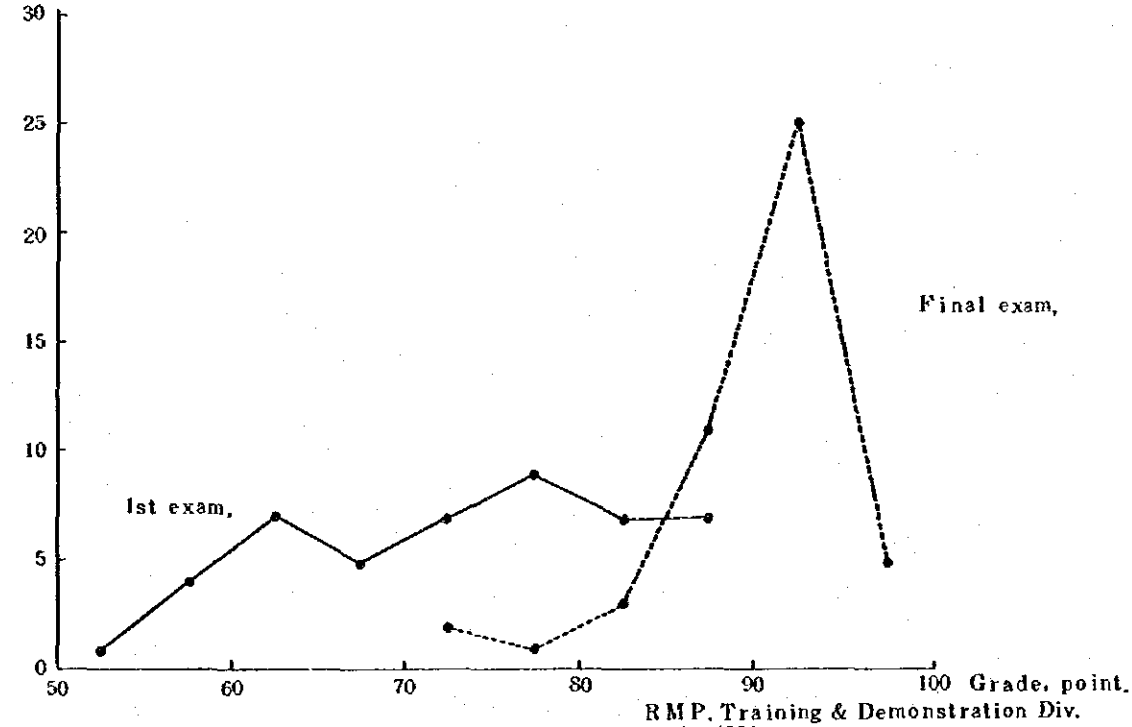
〔疑問点の検討〕

育苗担当期間中の討議は，そのニーズと共に，理解，定着は早く浸透する。現場講習会，郡内連絡会議の設定スケジュールのフオローアップ，オーバータイム予算を含め当局の指導が必要と思われる。現場担当者の技術レベルは，田植機械化作業精度，収量，成果，故障等に直接関連する重要なことであり，いまだ新しい技術の理解，定着，伝播には作業期間中の相

＊カフルエルシェーク県各地の調査に基づいて実際に即した設問を作成した。

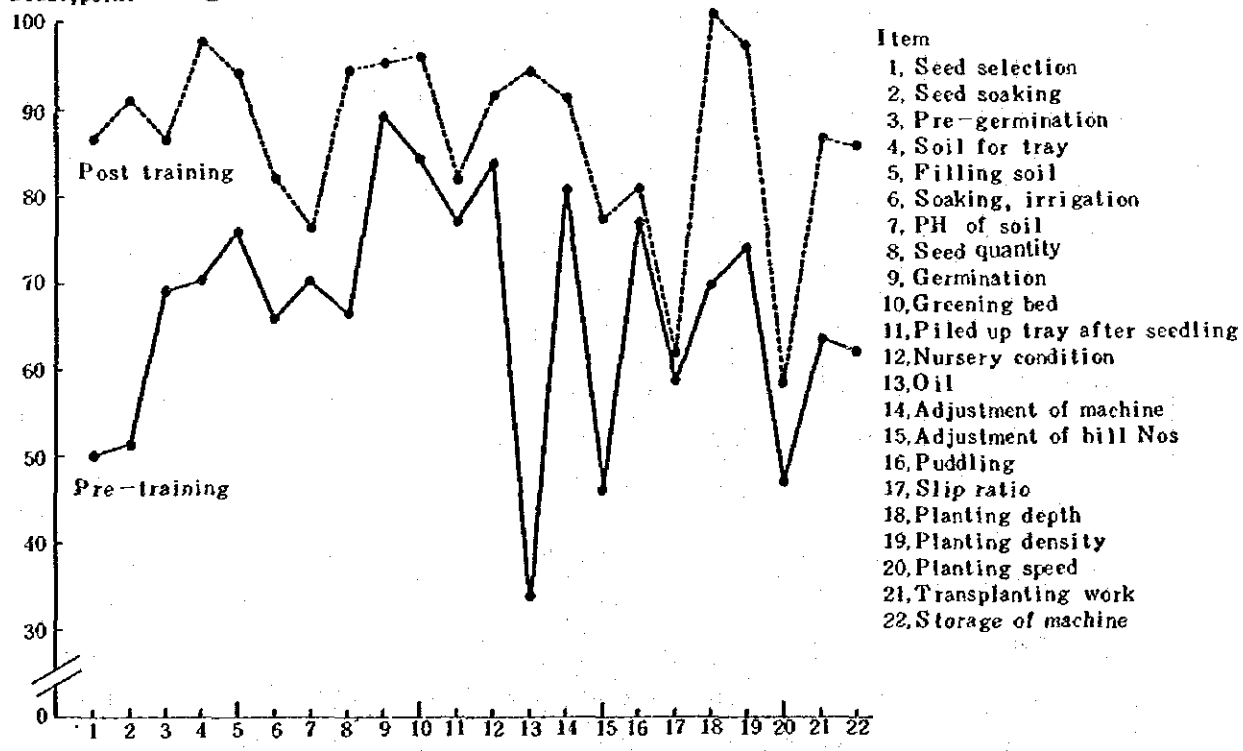
Fig. 1 THE EFFECT OF TRAINING.

Differene between the first examination(Pre-training) and the final examination. (Post training)



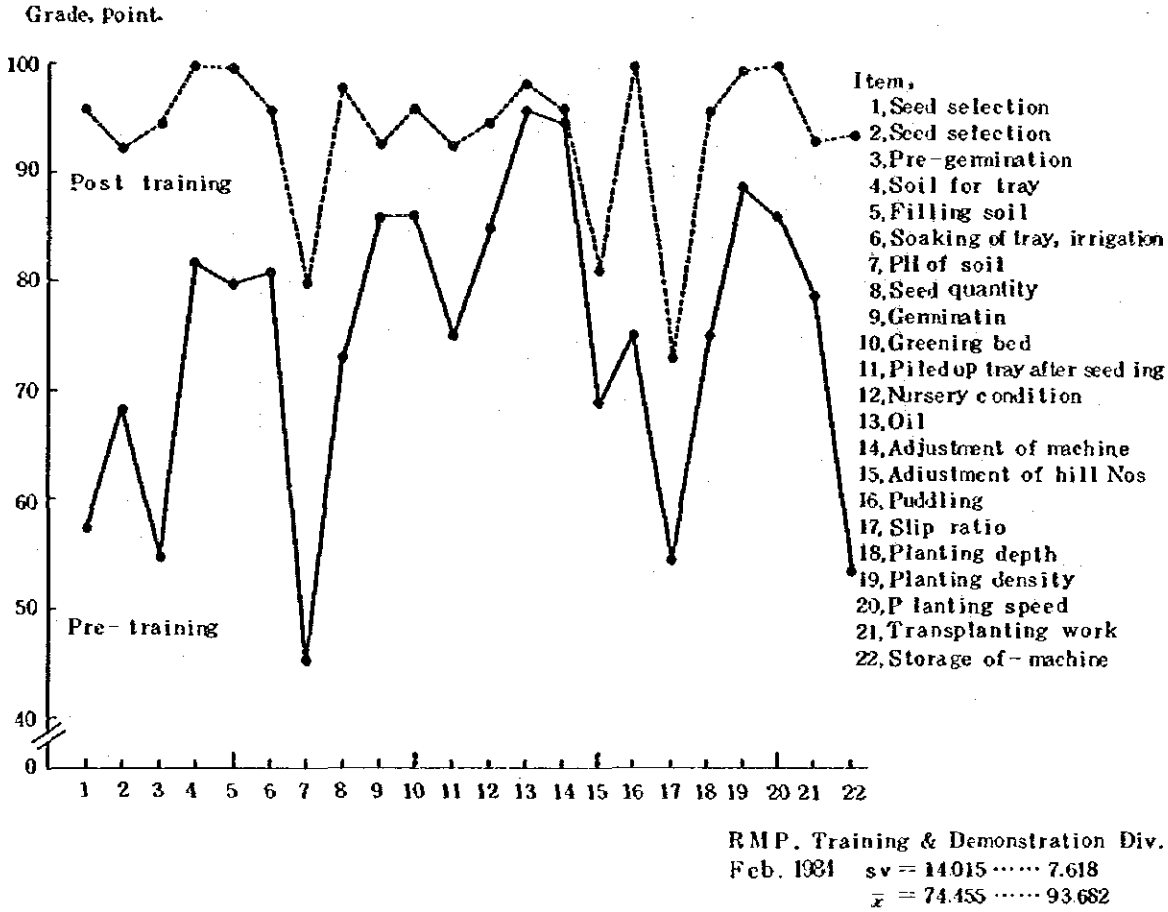
RMP. Training & Demonstration Div.
Feb. 1984

Fig. 2 DIFFERENCE BETWEEN PRE-TRAINING AND POST TRAINING



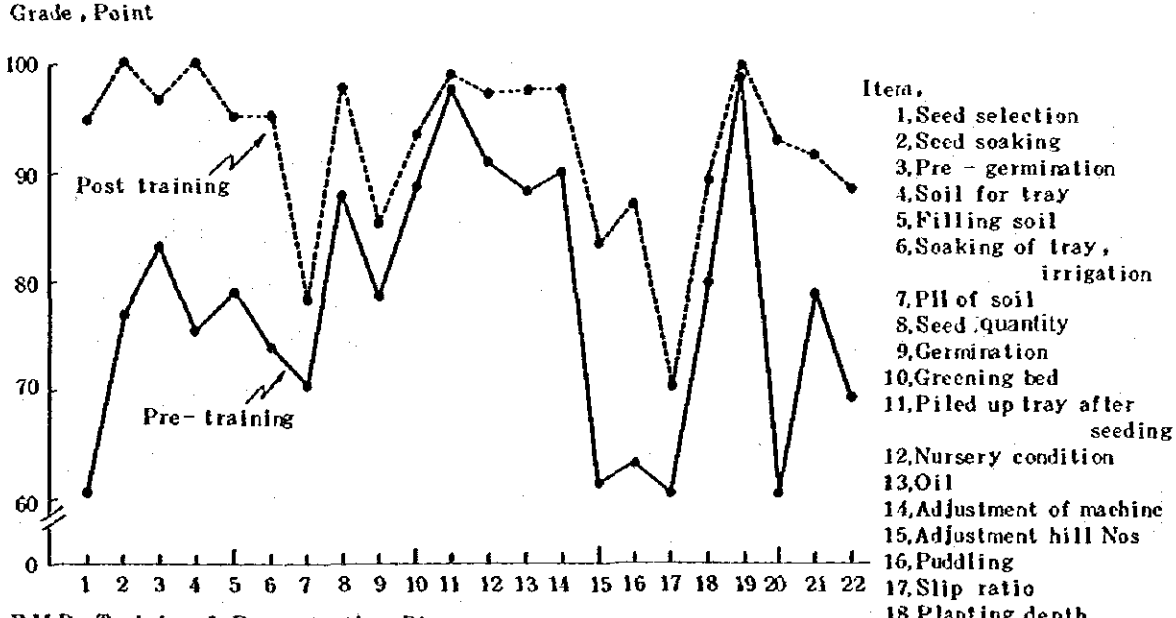
RMP. Training & Demonstration Div.
Dec. 1983 $n=22$ sv=13.59 …… 10.64
$\bar{x}$ =65.95 …… 85.91

Fig. 3 DIFFERENCE BETWEEN PRE-TRAINING AND POST-TRAINING



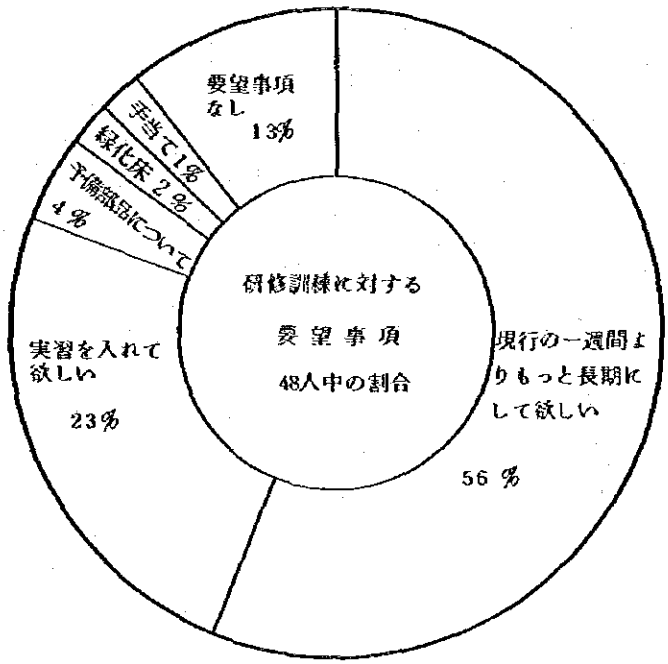
RMP. Training & Demonstration Div.
Feb. 1984 sv = 14.015 ····· 7.618
$\bar{x}$ = 74.455 ····· 93.682

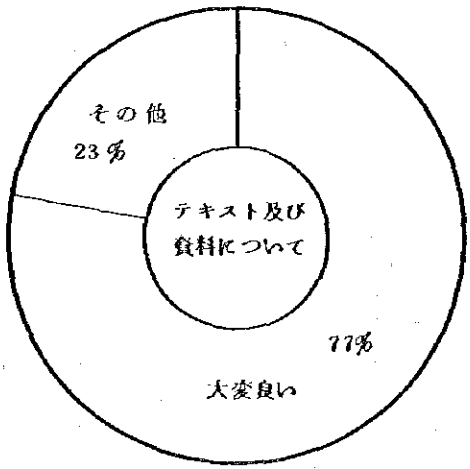
Fig. 4 DIFFERENCE IN TOPICAL KNOWLEDGE OF TRAINING BETWEEN PRE-TRAINING AND POST TRAINING

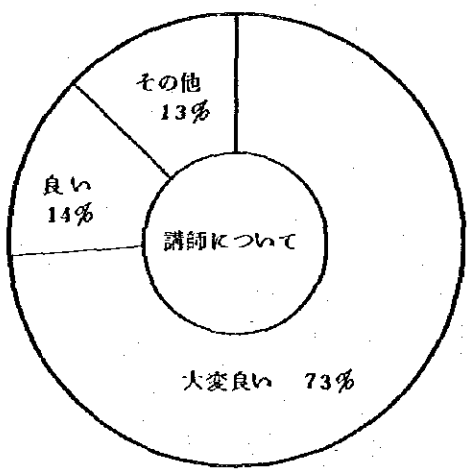


RMP. Training & Demonstration Div.
Feb. 1984 n=22 sv = 11.89 ····· 7.61
$\bar{x}$ = 77.45 ····· 91.91

図5　現地研修生に課したアンケート調査のまとめ







RMP　再訓練生48人1983年12月のアンケートより

互の問題点の検討や巡廻指導が行われることが望ましい。

又，訓練材料，講師に関する再訓練生のアンケートによれば，図５のように大むね良好となっているが，今後のよりよい訓練業務を運営するためには，現在のテキストを含めて更に実際に即したものの作成を常に心がけることが大切である。（フィードバックのためのトライアルの結果，及び試験結果を基に作成することを第１にすること。）

訓練期間については図５の通り，現行の１週間では短かく，もっと延長して欲しいという要望が全再訓練生の56％を示めている。これは訓練終了後の座談会においても田植機械化に係わる新技術，その中では特に播種量，植付本数，苗箱必要数，機械調整，pH，EC，Cl^-，機械植付作業についてもっと長時間をかけて欲しいという要望が話の中心になった。又，機械課員は機械の分解・組立を含む実習を入れて欲しいという要望が強い。研修・訓練・業務の向上のためには，現地のニーズの把握，センターでのトライアル試験，テキストの作成，講師の質的向上，訓練の分析が必要であり，上記アンケートによる要望等につき来期からの訓練業務に生かすべく検討している。

Ｋ・Ｆ県をとりまく田植機械化の動向は新技術導入，地域農業開発の上で１つの好モデルと考えられる。ＲＭＰにおける基礎及び応用試験，訓練，そして先行的調査研究活動，地域に即したテキストの作成，問題点解決のためのトライアル及びフィードバック，機械化稲作技術のメッカとしてのＲ・Ｍ・Ｐセンターの確立，センターと結びつくＫ・Ｆ県のローカルレベルでの機械化デモンストレーションの実施等々何れも本プロジェクトの結びつきは成功への大きなポイントになるものと考えられる。センターの確立なしでのデモンストレーション現地事情に合致するような技術的バックボーンをもたずに急激に拡げる機械化運動，現場での経験不足，技術的未熟，助言，指導体制の不備等は何れも大きな困難をもたらし，経済性を失う危険性があるので十分な注意が必要である。

第５節　部　落　調　査

Ｋ・Ｆ県対象の稲作に関しては，田植機械化，収穫機械化への農家からの要望が強くその実態調査を行っている。調査はいまだ継続中であるので，詳細報告は来年度になる予定である。しかし，調査対象の農民が何故に収穫機械化をそれ程強く要望しているかの原因は多くの労働（力）を必要とする慣行作業体系はインパクトが強すぎて，農外労賃の高騰，産油国への出稼ぎ等により労力の結集が農村地帯においては困難になりつつあるからだという感が強められた。収穫の機械導入なしでは，稲の作付を見合わせたという農家が多いもののようである。これらについても次の報告書に詳しくまとめる予定である。

第6節　む　す　び

当部は，他部に比べて発足が1年おくれたが，幸いにして優秀なスタッフに恵まれ，立上りは満足すべきものと見做している。ＲＭＰの成果をひろく波及させる為には，当部の役割は重大であることを認識し，今後ますます機能を充実しＲＭＰの所期の目的達成に貢献するよう努力するつもりである。

(附) 研修演示部職員

栽　培　課　員

1. Mohamad HAMAD
2. Nour SALEH　(R･M･Pから1984年2月29日から同年10月31日まで日本研修)
3. Fatihi ALNEMUL (K･Fから1983年5月25日～同年12月14日まで日本研修)
4. Essam MOHAMED
5. Mohamad YUSEF
6. Fittoh HISEN (1983年11月1日，K・F県農業局から当部に転勤)
7. Alaa EID　(　〃　〃　〃　)
8. Shawky MOHAMED (1984年3月4日，K・F県農業局から当部に転勤)

機　械　課　員

9. Mohamad NEIM
10. Asar Mohamad ASAR
11. Ebrahim YUSEF (1983年11月1日，K・F県農業局から当部に転勤)
12. Sayd KHANEM (1983年11月1日，当部からK・F農業局へ転勤)

附　　属　　資　　料

Annex 1

Preliminary Report on Research Highlights in 1983

PRELIMINARY REPORT ON RESEARCH HIGHLIGHTS IN 1983

December 1983

RICE MECHANIZATION PROJECT IN ARAB REPUBLIC OF EGYPT

MINISTRY OF AGRICULTURE

Dokki, Cairo

RICE MECHANIZATION PROJECT IN A.R.E.

PRELIMINARY REPORT ON RESEARCH HILIGHTS IN 1983

by

Toyoo Tomita* and Zakaria El-Haddad**

INTRODUCTION

According to the recent FAO announcement, the world production of food crops in 1983 was decreased 6% comparing with the last year's production. Especially food crop production in Africa was decresed 20% this year, and FAO fave warning against the declining trend of food crop production.

Even in Egypt, the declining trend of rice production has been clearly observed since later 1970s. On the other hand population in Egypt is quickly growing at the rate of 3%. Consequently, the self-sufficiency ratio of rice has been declining, and it was already dropped under the self-sufficiency line in 1982.

The quick increase in wage and low income are also restrictiong the farmers' enthusiasm toward rice production (refer to Annex 1).

Under such a food & agricultural situation, the Rice Mechanization Project in A.R.E.(hereinafter referred to as RMP) has been operated since April 1982, and RMP has experienced the second rice season at Kallin, KFS Governorate, this year. Various research work and experiments were carried out by Agronomy Division, Machinery Division and Training Division of RMP to establish some practical Rice Mechanization System in Egypt. Full report will be compiled in RMP's Annual Report 1983/'84, but some of the results obtained in 1983 will be briefly reported as the Preliminary Report on Research Hilights in 1983 in the following.

MATERIALS, TOOLS AND METHODS

I. Materials: As same as the previous year's experiments, AKIHIKARI (Japanese short duration variety), NIPPONBARE(medium variety), REIHO(late variety) and GIZA-172(Egyptian late variety) were used for the experiments. Three other Japanese varieties, HAYAKOGANE, ISHIKARI and YUHKARA(all are ultra-early varieties), are also used in the Double Cropping Test.

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* Leader, Japanese Experts dispatched for RMP
** Deputy Director, Agricultural Mechanization Projects, MOA

II. Tools:

(1) Seeding machine, Model YG-31, was used to raise seedlings of all varieties mentioned above. Pregerminated seeds were homogeneously sown on the plastic trays(30 x 60 x 3cm).

(2) Rotary cultivator(paddy harrow) was used together with cage-wheeled tractor to make land preparation and levelling of paddy fields.

(3) Transplanters, Model YP-6000 and NSR-6, were used for the transplanting of various tests. YP-8000 trasplanters, which were supplied by Egyptian Ministry of Agriculture, were also used for the outreach activities to collect data and information from various districts of KFS Governorate.

(4) Binder, Model YB302W, was used especially especially for the reap- of short-culmed varieties such as ISHIKARI, HAYAKOGANE and YUHKARA.

(5) Mobile thresher, Model PK-X7, was used to harvest the rice grains of reaped straws.

(6) Combines, Model TC-3500 and RX 2100, were used to harvest the rice grains from all the test plots. These were also used at several places where outreach activities were carried out to collect the data on harvesting performance and yields.

(7) Hand-made direct-sowing devices were manually and mechanically tested on the irrigated and puddled fields.

(8) As to the soil survey, the following equipments were used;

- pH meter (Model H-7, Hitachi-Horiba)
- Electric Conductivity Meter (Takemura Co.)
- Salt Analysis Kit (FHK Co.)
- Soil Analysis Kit (FHK Co.)
- Water Analysis Kit (Toyo Co.)

III. Methods: Depend on the testing item, methods were differed as written below.

1/ Double Cropping Test; AKIHIKARI, HAYAKIGANE, ISHIKARI, and YUHKARA were son on the plastic trays by seeding machine in the middle of March 1983, and the seedlings were grown under protected condition by using plastic film to avoid cold night temperature.

The transplanting of the first cropping was done during the period of April 6 - 16, 1983 at Kallin Station, the four varieties were mechanically transplanted respectively in the plots of Block D.

The mechanical harvesting of the first cropping was finished in the middle of August, and the yield of each variety was checked.

The mechanical transplanting of the second cropping was done immediately after the harvest of the first cropping, and the final day of the transplanting was August 20, 1983.

2/ Seedling Population Test; It is important to know the proper number of seedlings per hill to obtain the maximum yield. Therefore, ten plots were prepared for seedling population test where different number of seedling per hill were precisely transplanted by hand. GIZA-172 and NIPPONBARE were used in this test. Fertilizers were applied by element as follows, i.e. N 80kg/ha, P 60kg/ha, and K 30kg/ha. The transplanting density was fixed at 30 x 13cm (25.6hills/m^2).

3/ Identification of the number of mechanically trasplanted seedlings per hill; To know how to transplant the most adequate number of seedlings per hill by transplanter, interrelation among (a) seeding density, (b) transplanting capacity of the machine, and (c) the number of mechanically transplanted seedlings were studied.

The seeds of GIZA-172 (moisture content=14%, 1000 grain weight=25.8g,) were differently sown on the plastic trays at rate of 175g, 200g, and 300g per tray respectively, and the germination ratio was checked.

Meanwhile, land preparation and puddling were done at Kallin Station by making the soil-depth at 30cm, and the slip ratio of wheels of the transplanters (YP-6000 and YP-8000) were checked 3 days after the puddling.

On the other hand, the transplanting capacity (cutting capacity of seedling-blocks from the seedling-mat through the one stroke of transplanting finger) was variously adjusted so that seedling-block could be cut in the size of 10 x 10 x 30mm, 10 x 14 x 30mm, and 14 x 14 x 30mm respectively. During the mechanical transplanting work, the transmission was shifted at three levels to make three different interhillar distance, i.e. 14cm, 16cm and 18cm.

4/ Performance test of combine; At the two plots of Kallin Station where GIZA-172 and REIHO were ripened, the performance test of Japanese combine, TC-3500, were carried out. The conditions of two rice varieties before the mechanical harvesting were heavily or mederately lodged, i.e. the degree of loding of GIZA -172 and REIHO was 80° and 60° respectively.

The moisture content of GIZA-172 was 19%, and that of REIHO was 15%.

The combine was driven toward the lodged direction, and the driving speed was set at three levels. For GIZA-172, slow speed of 0.2, 0.37 & 0.41 m/sec, and for REIHO faster speeds, 0.70, 0.75 & 1.00m/sec., were applied.

As for the specification of TC-3500, the power of engine is 32 HP (2600 rpm), the size of threshing drum is 900mm x 420mm(diameter), the speed of threshing drum is 500 rpm, and the width of cutter bar is 1350mm (4-row harvesting type).

The following items were checked: (1) quantity of harvested straw per hour, (2) quantity of threshed paddy grains per hour, (3) chaff loss, (4) unthreshed loss, and (5) head loss.

5/ Soil/water survey ; A short-term expert of soil science* carried out a serie of soil/water survey by spending one month from October to November 1983. The soils and water were collected at various places within Kafr El Sheikh Governorate including Meet El Dyba, where the Rice Mechanization Center will be started soon. The pH, electric conductivity(mU/cm), and chlorine concentration(cl^-) were measured by several equipments listed below.

(i) HORIBA H-7 Type pH Meter
(ii) Electric Conductivity Meter, Takemura Co.
(iii) Salt Analysis Kit, FHK Type
(iv) Water Analysis Kit, Toyo-Roshi Co.
(v) Soil Analysis Kit, FHK Type.

6/ Econimic survey toward the expansion of Rice Mechanization; A short-term expert of agricultural econimics** was dispatched to RMP for two months from October to December, 1983. Econimic survey,by visiting a number of farmers' homes with the assistance of Egyptian counterparts, have done. The future direction of RMP's development was suggested based on the present economic situation of common farmers in KFS Gov.

7/ Preparation of a Ready Reckoner for the yield forecast and yield estimation; It is difficult to know the number of hills per square meter in the case of Egyptian traditional mannual transplanting. However, the number of hills per unit area can be precisely fixed by transplanting machine. Therefore, if the number of fully ripened grains per hill were figured out, the yield would be easily and quickly forecasted or estimated.

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** Dr. Tadao Hatano, Chief of Farm Management Lab., Division of Farm Technology, National Tohoku Agri. Exp. Station, Morioka, Japan

RESULTS AND DISCUSSIONS

1/ Double Cropping Test: As shown in Table 1, AKIHIKARI(Japanese early maturing, thermo-sensitive variety) was recommendable for the first cropping. The real yield of AKIHIKARI was 3.6 tons per feddan. However, ultra-early varieties such as YUHKARA, HAYAKOGANE, and ISHIKARI were not so effecient.

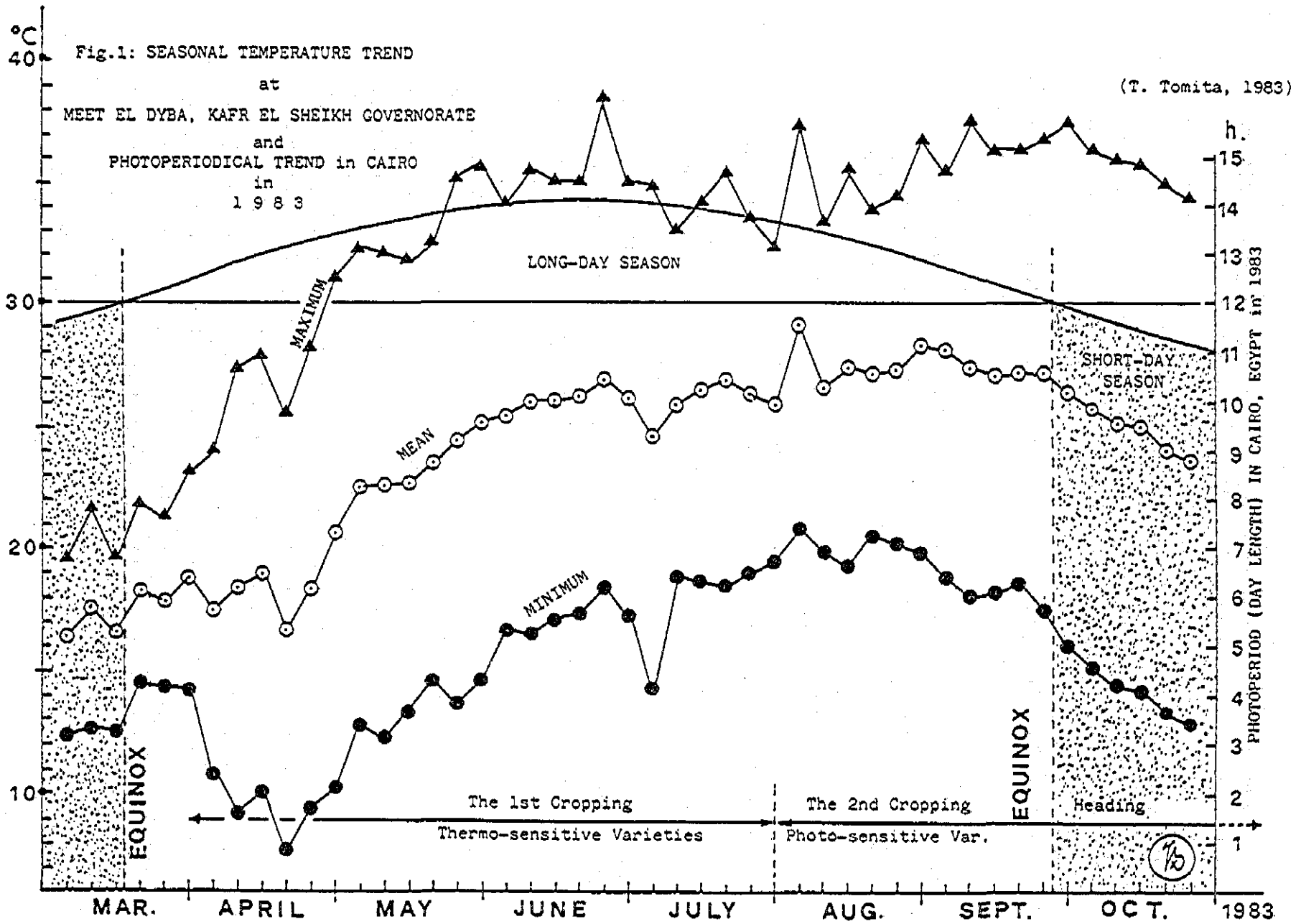
Table 1: Results of double cropping test done at RNP Kallin Station, 1983

The 1st cropping(April/August)		The 2nd cropping(August/Dec.)		Total Yield
AKIHIKARI	3.6 t/fed.	AKIHIKARI	1.5 t/fed	5.1 t/fed
YUHKARA	1.9	AKIHIKARI	1.5	3.4
HAYAKOGANE	1.6	AKIHIKARI	1.5	3.1
ISHIKARI	1.9	AKIHIKARI	1.5	3.4

Originally, the rice(Oriza sativa) belongs to "Short-day Plant", a physiological category in terms of flowering behavior, as same as chrysanthemum. Therefore, most of rice varieties in the tropics(native zone of rice) have strong photo-sensivity, and easily respond to the short-day photoperiod after the autumnal equinox. If they were exposed to some short-day conditions(less than 12-hour day-length) for few days, the ear primordia would soon be initiated and the ear emergence would be accelerated accordingly.

On the other hand, most of Japanese rice varieties have been bred to have "Thermo-sensivity", instead of "Photo-sensivity", so that they can respond to the temperature during short summer season in Japan. Therefore, *they emerge the ears in mid-summer under long-day condition.*

Fig. 1 was drawn based on the recent actual data collected at Meet El Dyba, Kafr El Sheikh Governorate, and the Arabic calendar of 1983. As Fig. 1 shows, the air temperature started to decline in early August and suddenly dropped at the end of September. According to the Arabic calendar, the autumnal equinox at Cairo was September 27. Therefore, if some photo-sensitive varieties were cultivated as the second crop, ear formation would be quickly taken place and heading(ear emergence) might be observed much earlier than AKIHIKARI. Practically, the ear emergence was greatly delayed in the second cropping, because of sudden drop of air temperature after September. However, AKIHIKARI was able to continue its ripening


°C
40
30
20
10
Fig.1: SEASONAL TEMPERATURE TREND
at
MEET EL DYBA, KAFR EL SHEIKH GOVERNORATE
and
PHOTOPERIODICAL TREND in CAIRO
in
1 9 8 3
(T. Tomita, 1983)
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LONG-DAY SEASON
SHORT-DAY SEASON
MAXIMUM
MEAN
MINIMUM
EQUINOX
EQUINOX
The 1st Cropping
Thermo-sensitive Varieties
The 2nd Cropping
Photo-sensitive Var.
Heading
MAR.
APRIL
MAY
JUNE
JULY
AUG.
SEPT.
OCT.
1983
PHOTOPERIOD (DAY LENGTH) IN CAIRO, EGYPT in 1983

even under cold winter condition because of its cold-resistant charater-istics.

Being under such a weather condition mentioned above, special attention should be paid for the double rice cropping in Egypt to seek some photo-sensitive and cold-resistant varieties.

The authors suppose that GIZA-172 and REIHO might have "Photo-sensi-tivity" to some extent, although a specific research should be done.

Meanwhile, RMP tentatively recommends the combination of AKIHIKARI(the 1st cropping) and REIHO(the second cropping) for double cropping, by trans-planting the former in early April and the latter in early August.

Since sparrows tend to swarm at the paddy fields where the first crop-ping rice are abnormally early, the first cropping should be widely practiced not only one places but also some other many places to avoid birds' damage.

2/ Seedling Population Test: The results were shown in Table 2 and Fig. 2. As the graph in Fig. 2 clearly indicates, the highest yield was obtained at the seedling population of 6/hill, as far as the transplanting density of 30 x 13cm(25.6 hills/m^2) is concerned.

It is necessary to consider that howmany seedlings per hill should be mechanically transplanted, not merely to transplant by machine.

As for the other type of varieties such as REIHO and GIZA-172, almost the similar number of seedlings would be recommended, because they grow higher than NIPPONBARE and some leafy populations are expected in their later growth stages, eapecially after ear emergence.

3/ Identification of the number of mechanically transplanted seedlings per hill: In connection with the finding mentioned in 2/, the effort to study the relationships between the seeding density per nursery tray and the trans-planting performance of Japanese transplanting machine was paid. The results of this experiment were shown in Table 3.

As underlined in the table, for instance, 4.7 per hill transplanted by "70"(Interhillar Distance:16cm), 10 x 14 x 30mm Seedling Block, and 26 hills per m^2 or 5.8 seedlings transplanted by "60", 10 x 14 x 30mm Seedling Block, and 23.5 hills/m^2 might be recommendable to obtain high yield as far as GIZA-172 is concerned. As to the other varieties, the similar test should be done.

The seedling block size, 14 x 14 x 30mm, is not recommendable, because of its requirment of large number of nursery trays.

Table 2 : Relation between the seedling population per hill and the yield per hectare(Transplanting density was fixed at 30 x 13 cm = 25.6 hills per square meter).

Plot Number		T-1	T-2	T-3	T-4	T-5	T-6	T-7	T-8	T-9	T-10
Population		2	4	6	8	10	12	14	16	18	20
Replication No.											
Yield per Hectare (ton)	1	6.87	9.22	10.76	9.97	9.07	5.05	8.40	7.45	6.39	5.49
	2	6.04	10.32	11.05	7.96	8.03	6.08	9.02	6.26	5.08	5.03
	3	7.57	8.10	12.49	9.54	8.47	7.80	7.65	6.07	6.25	6.31
	4	6.24	8.71	11.53	10.03	10.10	7.13	7.20	7.08	6.43	4.48
Average		6.68	9.09	11.46	9.37	8.92	6.52	8.08	6.72	6.04	5.32

Note: (1) The above data was collected at Plot 12, Block-C Field, where Japanes variety NIPPONBARE was grown.
(2) Amount of applied fertilyzers(by element) = N 80, P 60, K 30kg/ha
(3) Seeding: May 5, Transplanting: June 2, Harvest: Sept. 25, 1983

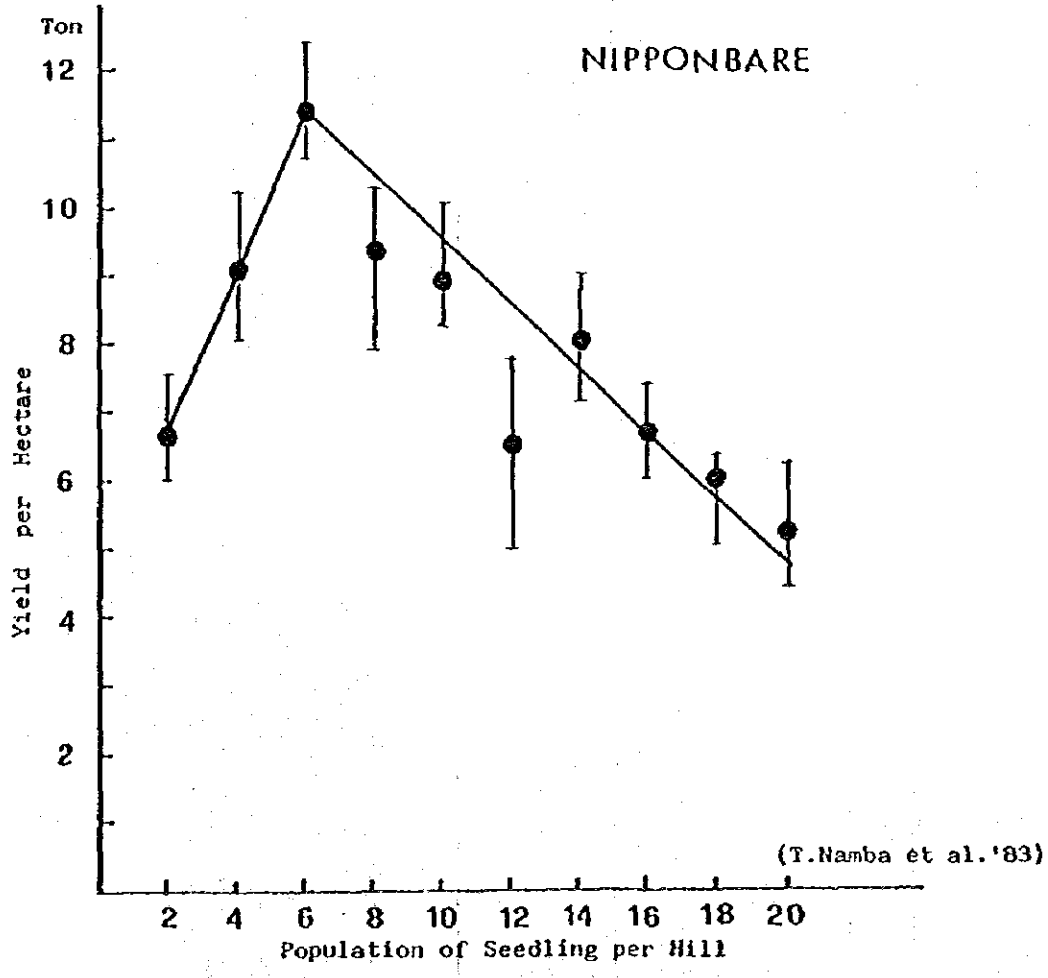


Fig. 2 : RELATION BETWEEN THE SEEDLING POPULATION PER HILL AND THE YIELD PER HECTARE

Table 3 : Relation between Seeding Density per Nursery Tray and the Transplanting Performance of Japanese Transplanter, Model YP-6000 & YP-8000.

Adjustment Index of Transplanter	Size of Seedling Block(mm)	Transplanting Density (hills/m^2)	Needed Number of Nursery Tray per Fed.	Seeding Density per Nursery Tray (300 x 600 x 30mm)							
				175gr*(335 cc)**		200gr(390 cc)		250gr(493cc)		300gr(572cc)	
				Population /Hill	Population /m^2	Population /Hill	Population /m^2	Population /Hill	Population /m^2	Population /Hill	Population /m^2
"60" Interhillar Distance: 18cm	10x10x30	23.5	64	2.9	66.9	3.3	76.6	4.2	95.7	5.0	115.0
	10x14x30		89	4.1	93.6	4.7	107.2	5.8	133.9	7.0	161.0
	14x14x30		124	5.7	131.1	6.5	149.9	8.2	187.5	9.8	225.4
"70" Interhillar Distance: 16cm	10x10x30	26	71	2.9	75.7	3.3	86.6	4.2	108.2	5.0	130.0
	10x14x30		100	4.1	105.8	4.7	121.2	5.8	151.3	7.0	182.0
	14x14x30		139	5.7	148.2	6.5	169.5	8.2	211.9	9.8	254.8
"80" Interhillar Distance: 14cm	10x10x30	30	82	2.9	82.3	3.3	99.9	4.2	124.8	5.0	150.0
	10x14x30		114	4.1	122.1	4.7	139.8	5.8	174.6	7.0	210.0
	14x14x30		159	5.7	171.0	6.5	195.6	8.2	244.5	9.8	294.0

(by S. Sugawara, Nour Saleh, Esam M. Ghazy & Mahmoud Hammad, 1983)

Note: (1) Variety: GIZA-172, 1000 Grain Weight = 25.86gr at 14% moisture content
(2) Germination Ratio = 70%
(3) * in Dry Weight
(4) ** Volume of pregerminated seeds
(5) Depth of mechanically transplanted field: 30cm, three days after puddling
(6) Slip Ratio of Transplanter: 20%
(7) Nursery Loss Ratio: 5%

4/ Perfomance Test of Combine: The results were summarised in Tables 4 & 5, and also in Figures 3 & 4. The conditions of standing rice plants at the time of mechanical harvesting were very differnt between GIZA-172 and REIHO. Therefore, the running speed of the combine was changed.

In the case of GIZA-172, the speed should be kept less than 0.4m/sec., because of GIZA's heavy lodging. As shown in Fig. 3, the quantity of straw harvested by combine was increased upto 0.37m/sec., but it was suddenly decreased when the combine was driven faster. Accordingly, the quantity of threshed grain was increased upto 0.37m/sec. It is quite resonable that amount of chaff loss was increased together with the increse of harvested straw. The amount of head loss and the amount of unthreshed loss were sharply incresed when the combine was driven faster than 0.37m/sec.

Generally speaking, as far as TC-3500 is concerned, the mechanical harvest in a heavily lodged paddy field should be done at slow speed. However, the available maximum speed may be different depend on the conditions of lodging, moisture content of straw/grain and soil.

In the REIHO field where lodging was moderate, the driving speed of combine was fastened upto 1m/sec. As Fig. 4 shows, quantity of harvested straw was quickly increased beyond 0.7m/sec., and stabilized between 0.8m/sec. and 1m/sec.. The quantity of threshed grain was gradually incresed according to the speed increase. Those ratios of chaff loss, head loss, and unthreshed loss were slightly incresed, but in a broad sense, these may be considered as negligible small.

In a moderately lodged paddy field, Japanese combine can be run at the speed of around 1m/sec., but much faster speed can be applied in an erect(unlodged) paddy field, although similar tests should be repeated further.

5/ Soil/Water Survey: The results of chemical and physical tests of soils and irrigation water collected at various places within Kafr El Sheikh are summarized in Tables 6,7,8,9, and 10.

As Table 6 indicates, pH of Meet El Dyba soils are generally high, although some fluctuations can be seen among four blocks. Soils around pH 9 may be called as Alkaline Soils or Solonetz, and are not so favourable for plant growth.

Fig. 3 : Perfomance test of TC-3500 at lodged GIZA-172 field

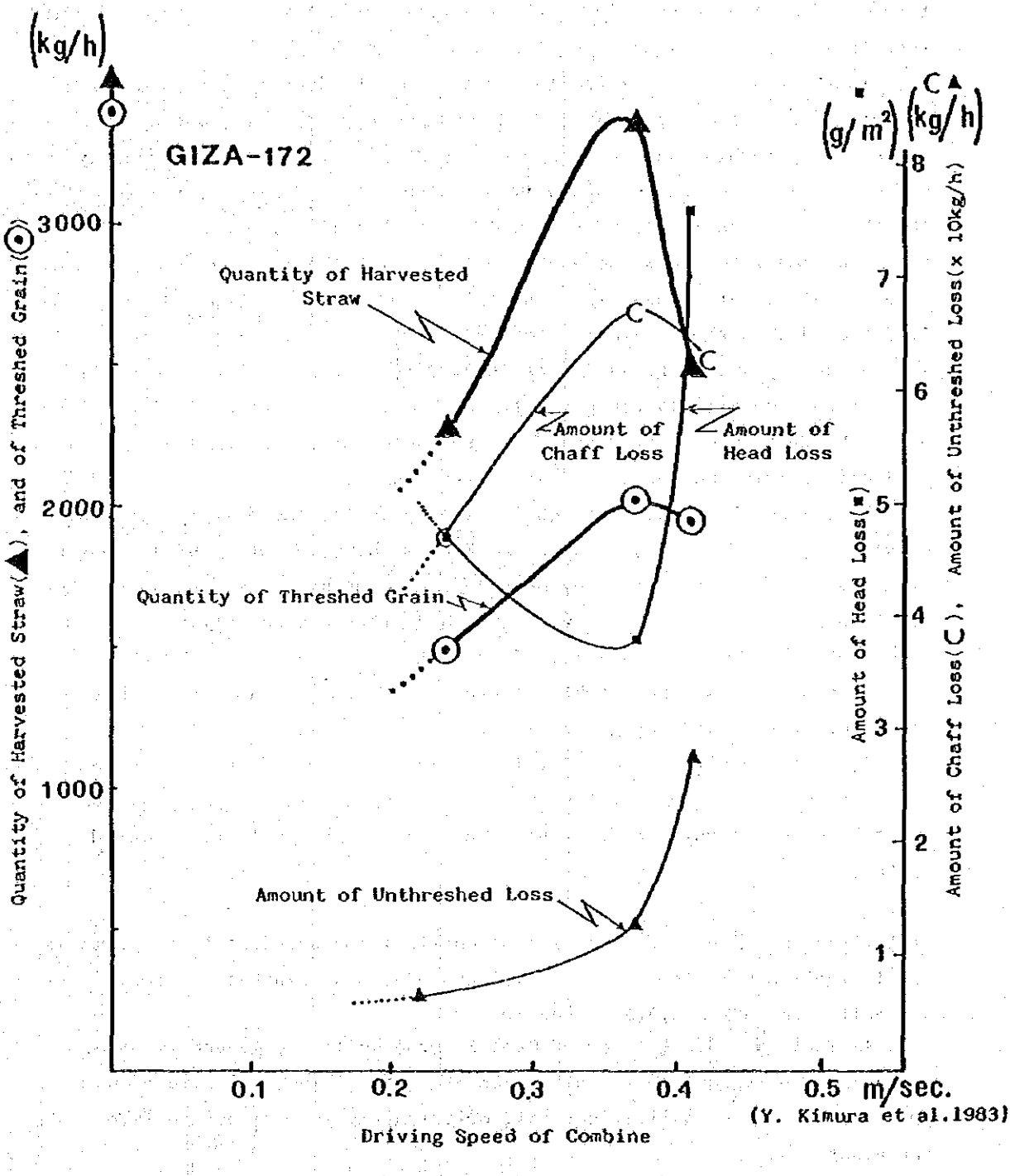


Fig. 4 : Performance test of TC-3500 at a moderately lodged REIHO field

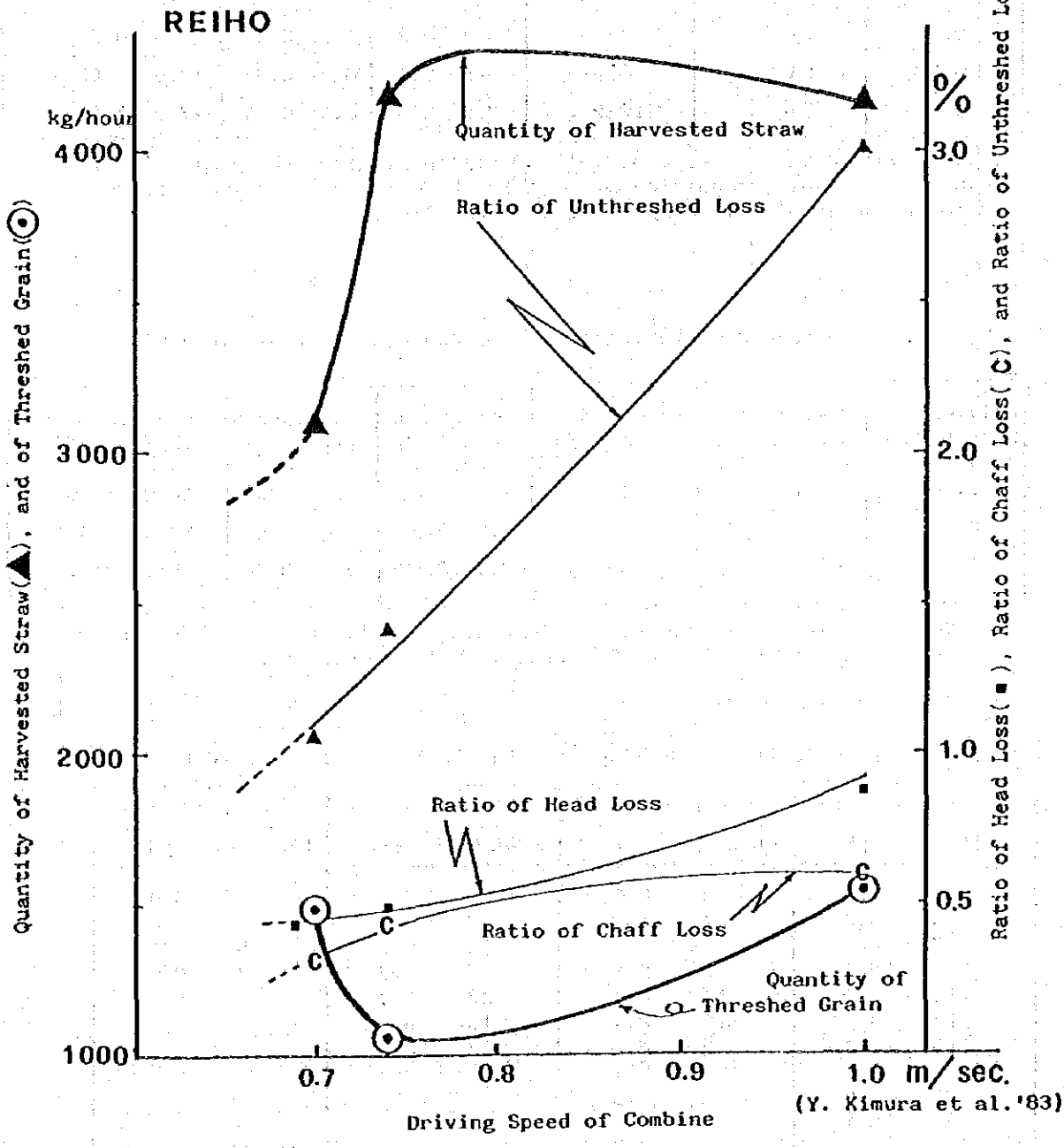


Table 4 : The first performance test of Japanese combine, TC-3500

Driving Speed(m/sec)	Harvested Straw(kg/h)	Threshed Grain(kg/h)	Head Loss (g/m^2)	(%)	Chaff Loss (kg/h)	(%)	Unthreshed Loss (kg/h)	(%)
0.24	2268	1448	4.7	0.34	4.7	0.33	5.6	0.38
0.37	3348	2007	3.8	0.32	6.7	0.33	12.6	0.65
0.41	2448	1932	7.6	0.82	6.5	0.33	27.2	1.35

The above data were obtained at RMP Kallin Station, where GIZA-172 was grown. The stahding condition of GIZA-172 before the mechanical harvest was lodged about 80 degree from the vertical line.

Table 5 : The second performance test of Japanese combine, TC-3500

Driving Speed(m/sec)	Harvested Straw(kg/h)	Threshed Grain(kg/h)	Head Loss (g/m^2)	(%)	Chaff Loss (kg/h)	(%)	Unthreshed Loss (kg/h)	(%)
0.70	3092	1408	2.1	0.45	4.6	0.32	14.9	1.06
0.74	4180	1049	2.0	0.48	6.4	0.45	20.0	1.41
1.00	4176	1535	3.1	0.87	9.3	0.60	46.3	3.00

The above test was done at the Kallin Experimantal Field where REIHO was ripened and lodged at ca. 60 degree from the vertical line.

Table 6 : pH of soils at RMC Experimental Fields, Meet El Dyba

Block-A Field		Block-B Field		Block-C Field		Block-D Field	
Plot No.	pH	Plot No.	pH	Plot No.	pH	Plot No.	pH
3	8.9	2	8.0	1	8.4	1	8.4
5	9.2	4	8.3	3	8.5	3	9.0
7	9.0	7	8.2	5	8.2	5	8.5
9	9.1	9	8.5	7	8.8	7	8.9
11	8.9	14	8.1	13	8.1		
13	8.3	16	8.7	15	8.2		
15	8.4	19	8.2	17	8.4		
19	8.4	21	8.2	19	8.8		
21	8.9						
23	9.1						
Mean	8.8		8.3		8.4		8.7

Table 7 : Electric conductivity of soils at RMC, Meet El Dyba

Block-A Field		Block-B Field		Block-C Field		Block-D Field	
Plot No.	EC(mU/cm)	P. No.	EC	Plot No.	EC	Plot No.	EC
3	0.56	2	1.10	1	0.86	1	0.51
5	0.60	4	0.65	3	1.29	3	0.39
7	0.36	7	1.55	5	9.96	5	0.58
9	0.86	9	0.83	7	0.64	7	0.42
11	0.58	14	2.50	13	6.66		
13	0.45	16	1.30	15	3.36		
15	0.43	19	1.08	17	1.54		
19	0.35	21	2.20	19	0.60		
21	0.42						
23	0.78						
Mean	0.54		1.40		3.11		0.73

There are also differences in Electric Conductivity(mU/cm) among four blocks. The soils sampled at Block-C Field showed the highest value, and those at Block-A recorded low EC value. If rice were cultivated in these fields, yield of each plot might be different. At some spots in Block-B and Block-C, soils seemed to be Saline Soil were sampled.

Table 8 : Chlorine concentration(Cl^-) of soils at RMC, Meet El Dyba

Block-A Field		Block-B Field		Block-C Field		Block-D Field	
Plot No.	Cl^-	Plot No.	Cl^-	Plot No.	Cl^-	Plot No.	Cl^-
5	225 ppm	2	375 ppm	3	1160ppm	1	795 ppm
7	240	4	219	5	7050	3	96
9	390	7	855	7	195		
23	549	9	150	13	4650		
		14	1395	15	1800		
		16	510				
		19	540				
		21	945				

There are high correlation between Electric Conductivity and Chlorine concentration. The soil valued high EC also showed high Cl^- concentration. Assuming from the high Cl^- concentration in Block-C, the high value of EC might be caused by NaCl.

The safety standard of Cl^- concentration of paddy field is ranged 300 to 500 ppm, and the warning standard is 700 ppm. Therefore, some counter-measures should be done at various plots in RMC Experimental Fields.

Table 9 : Water Survey in Kafr El Sheikh

District/Village	Sample	pH	EC(mU/cm)	Cl^- (ppm)
Hamol El-Banna	537	7.5	1.43	240
ditto	538	7.4	1.25	381
Ceedy-Salem	533	7.4	0.60	90
ditto	534	7.7	0.36	45
ditto	535	7.7	0.38	43
ditto	536	8.3	1.30	216
Kallin El-Marazka	521	7.8	0.34	29
El-Bahare	522	7.8	0.31	24
El-Menshlen	523	7.7	0.33	24
Sarawa	524	7.9	0.35	26
Meet El Dyba	525	7.8	0.35	26
Tawelet Nashart	526	7.8	0.31	24
El Unamy	527	7.8	0.30	21

The irrigation water in Hamol District possessed high EC value and high Cl^- concentration comparing with those in other two Districts of Ceedy-Salem and Kallin. Some difficulties may be expected in raising rice seedlings and in high-yield rice cultivation in Hamol District.

The favourable pH standard of irrigation water for paddy field is 6.0 - 7.5, and EC standard supposed to be lower than 0.3 mU/cm. Therefore, the values listed in Table 9 are generally higher than Japanese Standard.

Table 10: Soil Survey in Kafr El Sheikh

Disouk			Kallin			Ceedy-Salem			Hamol		
Sample	pH	EC	Sample	pH	EC	Sampla	pH	EC	Sample	pH	EC
1	8.2	0.64	521	8.5	0.30	533	7.9	0.49	537	8.2	1.01
2	8.5	0.53	522	8.4	0.29	534	8.2	0.96	538	8.0	2.21
3	8.2	0.98	523	8.3	0.33	535	8.1	0.98	539	8.0	2.26
4	8.7	0.86	524	8.5	0.30	536	8.4	0.96	540	8.7	0.59
5	8.6	0.56	525	8.7	0.23						
6	8.8	0.49	526	8.5	0.28						
7	8.4	0.33	527	8.2	1.56						
8	8.2	0.71	528	8.4	0.45						
9	7.9	0.58	529	8.4	0.43						
10	8.2	0.85	530	8.5	0.39						
			531	8.5	0.37						
			532	8.5	0.70						
Mean	8.4	0.65	Mean	8.5	0.47	Mean	8.2	0.84	Mean	8.2	1.51

There are some fluctuations among the analytical data listed above, but as far as the means are concerned, Kallin soils are slightly higher in pH than other soils collected in Ceedy-Salem and Hamol. On the contrary, EC

of Ceedy-Salem soils and Hamol soils were obviously higher than those of Kallin and Disouk.

Table 11 : Cl^- concentration of soils sampled in four districts, KFS.

Disouk		Kallin		Ceedy-Salem		Hamol	
Sample No.	Cl^-	No.	Cl^-	No.	Cl^-	No.	Cl^-
1	225 ppm	525	120	534	576	537	335
3	324	527	1080			538	1200
7	105	532	420			539	1020
						540	366

Referring to the data on Table 10, for instance Sample No. 527, 538, and 539 showed high EC values of 1.56, 2.21, & 2.26 mU/cm respectively. They also recorded high concentration of Cl^-, i.e. 1080, 1200, and 1020 ppm. Therefore, high concentration of Cl^- seemed to restrict the growth of rice. The measurment of EC is the simplest, and this may be practical and useful at any site of paddy fields. The interrelation between yield and EC may be clearly observed.

Briefly speaking, the experimental fields of RMC at Meet El Dyba consist of Alkaline Soils and Saline Soils. The former may contain sodium carbonate or sodium bicarbonate, and the latter involves sodium chloride. Both soils are considerably bad in physical property, and then positive cropping of leguminous plants are recommended. Under drain by crossing with mole drain should be practiced to eliminate salinity. Such soils mentioned above tend to change some heavy metals towards unavailable condition. Therefore, the applications of iron, zinc, copper and manganese may be useful from the standpoint of rice nutrition.

6/ Economic survey toward the expansion of Rice Mechanization: Several intersting results were obtained by the colaboration with RMP Egyptian staff. Two results are shown in the following pages.

Table 12 explains the econimic condition of rice farmers in KFS Govrnorate in 1983. The comparison between mechanized transplanting and ordinary mannual transplanting was done, by visiting numerous farmers' home. The detailed explanation is written in the Arabic Text made for RMP Trainees.

Fig. 5 indicates the Break-even Point of mechanized transplanting in Kafr El Sheikh Governorate.

Table 12 : Comparison of cost between mechanized and ordinary transplanting

Items	Mechanized Transpanting	Ordinary Transplanting
Nursing Cost/feddan		
Land	1.50 L.E.	6.00 L.E.
Seed	3.75	8.40
Preparation of nursery bed etc.	6.10	8.50
Fertilizer/Chemicals	2.40	4.00
Seeding	5.00	1.00
Take Care(water/weed)	3.50	9.00
Plastic Trays	19.50	0
Sub-Total	41.75	36.90
Transplanting Cost/feddan		
Seedling collection	0.50 L.E.	10.00 L.E
Transport of seedling	1.75	10.00
Transplanting	26.90	25.00
Sub-Total	29.15	45.00
Total	70.90	81.90

Figuring out from the data in Table 12, the mechanized transplanting is cheaper than the ordinary mannual method at 11% level. As to the nursing cost, mechanized method is more expensive than ordinary method(13%), because of the cost for purchasing of plastic trays. On the contrary, mechanized transplanting is much cheaper(35%) than ortinary mannual transplanting.

The mechanized transplanting can be done at very low labor(18%), comparing with Egyptian traditional transplanting. Such labor saving is quite significant for farmers at this season.

According to Fig. 5, the break-even point of machanized transplanting by 6- & 8-row transplater was found around 50 feddans, and that of 4-row walking type was dropped around 30 feddans, as far as the cost per feddan is concerned. However, Fig. 5 was drawn based on the currency condition of 1 US$ = 1.22 Egyptian Pound as of October 1983. If the condition of 1 US$ = 0.82 L.E. were applied, the cost benefit would be much higher than 11% as mentioned above. If the skill of machinery operators were improved and they were acquainted with mechanized method, the break-even point would be much lower than 50 feddans in case of 6-row or 8-row transplanter.

Fig. 5 : The cost of mechanized transplanting and the break-even points of mechanical transplanting done by 4-row walking type transplanter, 6-row & 8-row riding type transplanters

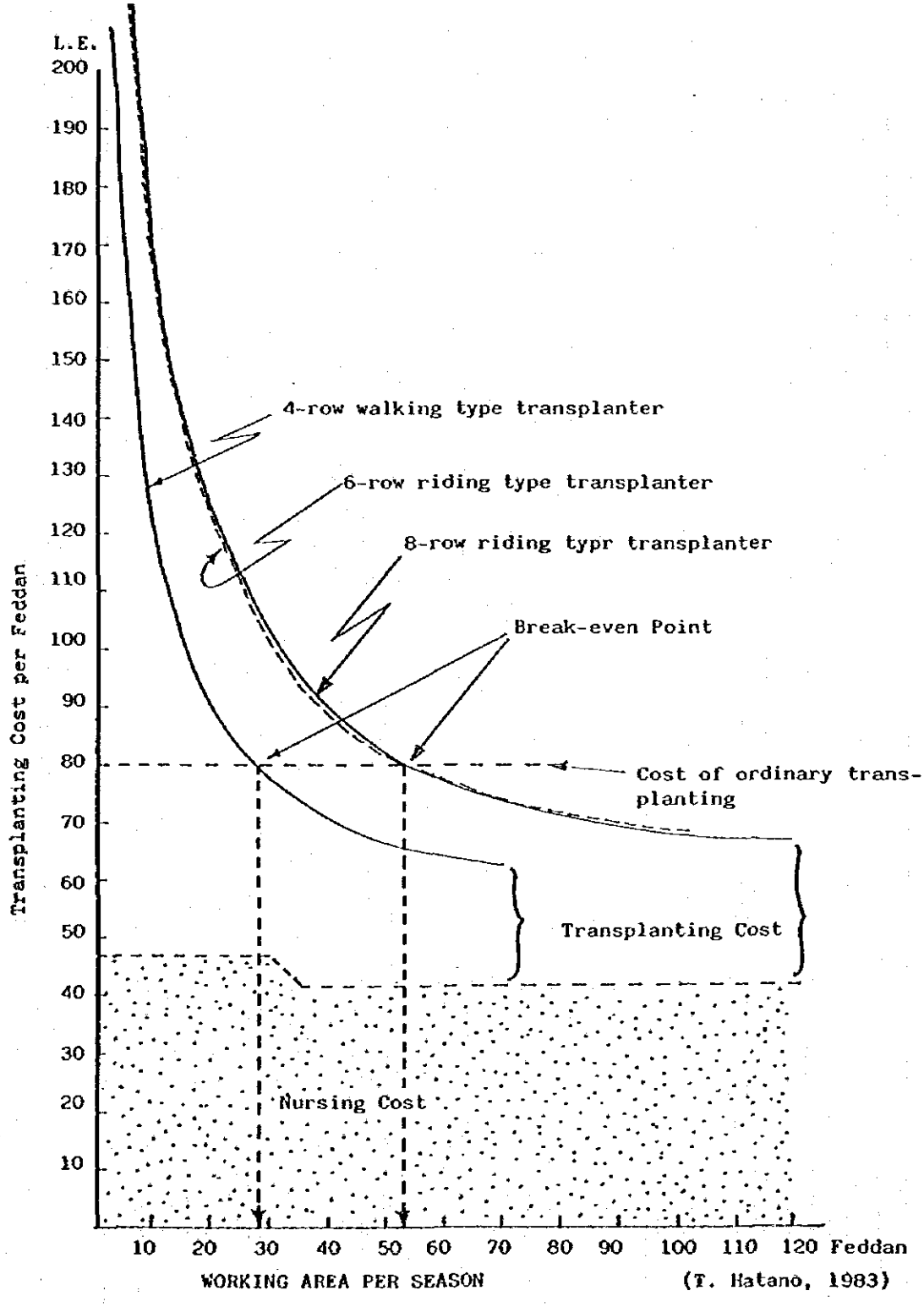


Table: 13 A Ready Reckoner for the Yield of Paddy Grains(tons/ha or tons/feddan) based on the total number of fully ripened Grains per Hill and the Transplanting Density

- Effective for GIZA-172, REIHO and Similar Varieties -

Number of Grains per Hill	Number of Hills per m^2								
	15	18	20	23	25	28	30	33	35
	t/ha(t/fed)	t/ha(t/fed)	t/ha(t/fed)	t/ha(t/fed)	t/ha(t/fed)	t/ha(t/fed)	t/ha(t/fed)	t/ha(t/fed)	t/ha(t/fed)
200	0.75(0.32)	0.90(0.38)	1.00(0.42)	1.15(0.48)	1.25(0.53)	1.40(0.59)	1.50(0.63)	1.65(0.69)	1.75(0.74)
300	1.13(0.47)	1.35(0.57)	1.50(0.63)	1.73(0.73)	1.88(0.79)	2.10(0.88)	2.25(0.95)	2.48(1.04)	2.63(1.10)
400	1.50(0.63)	1.80(0.76)	2.00(0.84)	2.30(0.97)	2.50(1.05)	2.80(1.18)	3.00(1.26)	3.30(1.39)	3.50(1.47)
500	1.80(0.76)	2.25(0.95)	2.50(1.05)	2.88(1.21)	3.13(1.31)	3.50(1.47)	3.75(1.58)	4.13(1.73)	4.38(1.84)
600	2.25(0.95)	2.70(1.13)	3.00(1.26)	3.45(1.45)	3.75(1.58)	4.20(1.76)	4.50(1.89)	4.95(2.80)	5.25(2.21)
700	2.63(1.10)	3.15(1.32)	3.50(1.47)	4.03(1.06)	4.38(1.84)	4.90(2.06)	5.25(2.21)	5.78(2.43)	6.13(2.57)
800	3.00(1.26)	3.60(1.51)	4.00(1.68)	4.60(1.93)	5.00(2.10)	5.60(2.35)	6.00(2.52)	6.60(2.77)	7.00(2.94)
900	3.38(1.42)	4.05(1.70)	4.50(1.89)	5.18(2.18)	5.63(2.36)	6.30(2.65)	6.75(2.84)	7.43(3.12)	7.88(3.31)
1000	3.75(1.58)	4.50(1.89)	5.00(2.10)	5.75(2.42)	6.25(2.63)	7.00(2.94)	7.50(3.15)	8.25(3.47)	8.75(3.68)
1100	4.13(1.73)	4.95(2.08)	5.50(2.31)	6.33(2.66)	6.88(2.89)	7.70(3.23)	8.25(3.47)	9.08(3.81)	9.63(4.04)
1200	4.50(1.89)	5.40(2.27)	6.00(2.52)	6.90(2.90)	7.50(3.15)	8.40(3.53)	9.00(3.78)	9.90(4.16)	10.50(4.41)
1300	4.88(2.05)	5.85(2.46)	6.50(2.73)	7.48(3.14)	8.10(3.40)	9.10(3.82)	9.75(4.10)	10.73(4.51)	11.38(4.78)
1400	5.25(2.21)	6.30(2.65)	7.00(2.94)	8.05(3.38)	8.70(3.65)	9.80(4.12)	10.50(4.41)	11.55(4.85)	12.25(5.15)
1500	5.63(2.36)	6.75(2.84)	7.50(3.15)	8.63(3.62)	9.38(3.94)	10.50(4.11)	11.25(4.73)	12.38(5.20)	13.13(5.51)
1600	6.00(2.52)	7.20(3.02)	8.00(3.36)	9.20(3.86)	10.00(4.20)	11.20(4.70)	12.00(5.04)	13.20(5.54)	14.00(5.88)
1700	6.38(2.68)	7.65(3.21)	8.50(3.57)	9.78(4.11)	10.63(4.46)	11.90(5.00)	12.75(5.36)	14.03(5.89)	
1800	6.75(2.84)	8.10(3.40)	9.00(3.78)	10.35(4.35)	11.25(4.73)	12.60(5.29)	13.50(5.67)		
1900	7.13(2.99)	8.55(3.59)	9.50(3.99)	10.93(4.59)	11.88(4.99)	13.30(5.59)	14.25(5.99)		
2000	7.50(3.15)	9.00(3.78)	10.00(4.20)	11.53(4.84)	12.50(5.25)	14.00(5.88)			
2100	7.88(3.31)	9.45(3.97)	10.50(4.41)	12.08(5.07)	13.13(5.51)				
2200	8.25(3.47)	9.90(4.16)	11.00(4.62)	12.65(5.31)	13.75(5.78)				
2300	8.63(3.62)	10.35(4.35)	11.50(4.83)	13.23(5.56)					
2400	9.00(3.78)	10.80(4.54)	12.00(5.04)	13.80(5.80)					
2500	9.38(3.94)	11.25(4.73)	12.50(5.25)						

T. Tomita, 1983

Note: This table was prepared for the Yield Forecast and quick estimation of paddy yield of Japaonica-type rice, such as GIZA-172 and REIHO, which have 25 gram in 1000 Grain Weight at 14% Moisture Content.
If 1500 fully ripened grains were obtained per hill at the spacing of 30 hills per square meter, the yield of paddy(unhulled rice) per feddan comes to 4.73 tons.

7/ Ready Reckoner for the yield forecasting and yield estimation:

Since the yield of rice grain per unit area(1 m^2) consists of the following factors, if the number of fully ripened grains per hill were counted, the yield of any mechanically transplanted paddy field can be easily forecated right after the ear emergence.

Yield Component:
(a) Number of hills per square meter
(b) Number of panicles per hill
(c) Number of grains per panicle
(d) Ripening ratio (%)
(e) 1000 grain weight (g)

Table 13 was prepared based on the yield component mentioned above, as GIZA-172's 1000 grain weight would be 25 gram at 14% moisture content. In the cases of REIHO and NIPPONBARE, this redy reckoner is available.

However, the paddy field where rice seedlings were randomly transplanted by ordinary method can not be forecated its yield through this table.

The yield forecasting is important for Egyptian agricultural policy to make necessary preparations in advance to secure the national food / agriculture plan. After August, monthly rice-crop forecast is reported from every governorate to the central office, and then nation-wide yield forecast is officially announced through newspaper. Such crop forecasting program can only be done by the complete achievement of RICE MECHANIZATION PROJECT in A.R.E. which has been executed at Kafr El Sheikh by the international technical cooperation between Egypt and Japan.

SUMMARY

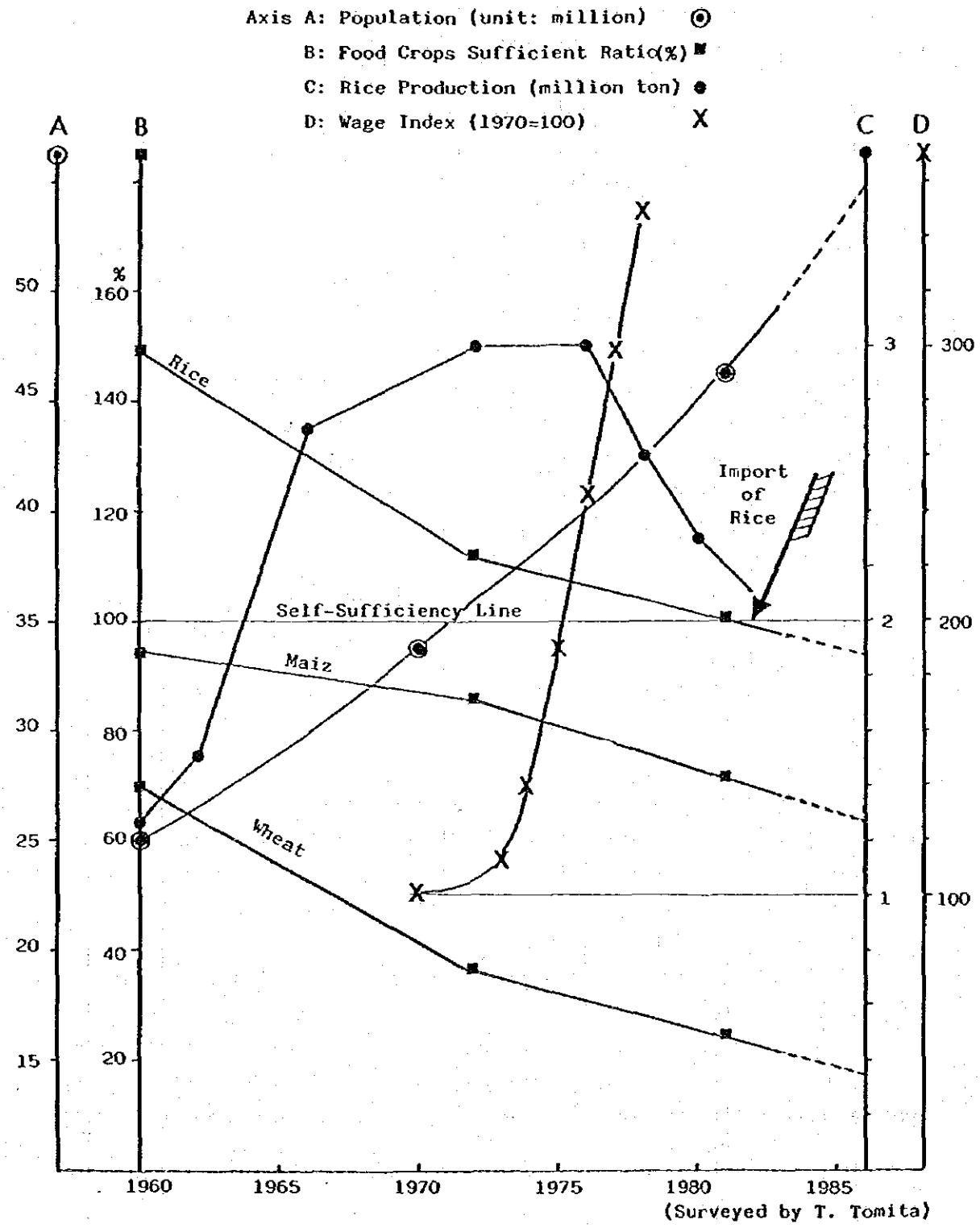
Japan took at least 30 years to establish her rice mechanization system with the tight colaboration among agricultural scientists, engineers, farmers and agricultural machinery plants. Even in Egypt, basic studies in various aspects should be done, otherwise every effort would be vain.

The sense of Rice Ecology is strongly requested to all the concerned people in Egypt. The rice mechanization is not to introduce rice machinery and simply to operate them.

If this brief report of RMP Hilight 1983 were useful for 1984's rice mechanization practice in Egypt, the authors and their staff would be very pleased. The full report will be issued later as RMP Annual Report 1983-'84.

Annex 1

TREND OF FOOD & AGRICULTURAL SITUATION IN RECENT EGYPT



Sources: MOA Statistics 1980
Agricultural Economics Research Institute, MOA
H.A. Tobgy: Contemporary Egyptian Agriculture, 1976

ANNEX 2 : Proof Test of RMP-Method at a farmer's field at El Manshea Sogohla, Kallin District, Kafr El Sheikh Governorate in 1983

	RMP - Method (Mechanical Transplant)	Ordinary Method (Mannual Transplanting)
Yield(tons/feddans)	4.59	2.88
Number of hills per square meter	29.8	19.3
Average number of panicle per hill	16.3	29.5
Average number of spikelet per panicle	99.5	67.8
Ripening ratio	89.3%	79.8%
1000 Grain Weight	25.33 g	22.26 g

Note: Transplanting Date: June 1, 1983
Harvesting Date: October 16, 1983
Variety: GIZA-172
Fertilizer application was done as follows;

	Basal Dose	Top Dressing(1)	Top Dressing(2)	Total
Nitogen(as element)	45 kg	22.5 kg	22.5 kg	90 kg
Phosphate(ditto)	15.5 kg	nil	nil	15.5 kg
Potassium(ditto)	nil	nil	nil	nil

Comparison was done at the same village.

Annex 2

日埃合同委員会資料

RICE MECHANIZATION PROJECT
in Arab Republic of Egypt
MOA – JICA

Workshop Bldg. MOA
Nady EL Said St. Dokki
Giza — Cairo — Egypt
Telephone : 702543

مشروع ميكنـــة الارز
وزارة الزراعة/هيئة التعاون القومي اليابانى
ادارة الورش
ش نادي الصيد – الدقي
الجيزة — القـاهرة
تليفون ٧٠٢٥٤٣

MINUTES

THE 2RD JOINT COMMITTEE MEETING

R M P

EGYPT — JAPAN
(MOA) (JICA)

RICE MECHANIZATION PROJECT in Arab Republic of Egypt

The Second JOINT COMMITTEE MEETING

Date/Time: Saturday,April 2, 1983 from 12:00 to 14:00 hours

Place: R.M.P., Cairo Office,Workshop Building,MOA,Dokki

Attendant: Egyptian Side

Dr. Ahmed Farid El Sahrigi, Director of Agri. Mechani. Projects
Dr. Zakaria El Haddad, Deputy Director, A. M. P., MOA
Dr. Mamdoouh Baz, Head of Extension Div., MOA
Mr. Alla El Sombaty, Undersecretary, KFS Covernorate
Mr. Abd El Azziz Doma, Director of Kallin Agri. Experi. Stn.
Mr. Osama Kamel, RMP Coordinator
Mr. Moustafa Abbas, RMP Counterpart

Japanese Side

Dr. Toyoo Tomita, Team Leader
Mr. Teruhisa Namba, Agronomy Expert
Mr. Yasuhiro Kimura, Machinery Expert
Mr. Seiich Sugawara, Machinery Expert
Mr. Takeshi Naruse, Coordinator
Mr. Junsaku Koizumi, Director of JICA Cairo Office
Mr. Osamu Nakai, First Secretary, Embassy of Japan, Cairo

Chairmen: Dr. Ahmed F. El Sahrigi & Dr. Toyoo Tomita

Agenda: 1) Opening Address by Dr. A. F. El Sahrigi
2) Review on RMP Activities in 1982 ----------Annex a
3) Planning of Program for next year, 1983/'84 at Kallin and Meet El Dyba ----------Annex b
4) Training Program for (i) In-Country and (ii) in Japan ----------Annex c
5) Report on 1982 Budget ----------Annex d
6) Budget Allocation for1983 ----------Annex e
7) Others (i) Publication of Text for Training
(ii) Publication of RMP Annual Report 1982
(iii)Publication of RMP Pamphlet

Annex a

Review on RMP Activities in 1982

1. Assembling and adjusting of machinery (Machinery Division) ----April
2. Seed selection, seeding and nursing (Agronomy Division) -------April
3. Infrastructural Works were completed at Kallin ----------May
4. Land Preparation, puddling and levelling (Machinery Div.) -----May
5. Transplanting by machine (Machinery & Agronomy Div.s) ---------May - June
6. Opening Ceremony of RMP at Kallin ----------June 14
7. RMP Endorsement by Egypt/Japan ----------June 29
8. The First Joint Committee Meeting ----------August 3
9. Demonstration Gathering for mechanical harvest ----------August 31
10. The first issue of RMP Newsletter ----------August
11. Submitted the RMP Preliminary Progress Report to the Minister -September
12. Received the 2nd donated machinery & equipments at Kallin -----October
13. Opened the Training Class & Workshop for KFS extension staff --October
14. Outreach Service * ----------November
15. RMP Newsletter, No. 2 was issued ----------Dec.1982
16. Thanksgiving Party (Host: Japanese Team) ----------December
17. Presentation of RMP Pearl Rice to concerned VIPs ----------December
18. Infrastructural works at Meet El Dyba started ----------December
19. Rice Mechanization Center: Construction work started ----------January'83
20. Dr. Sahrigi visited Japan as Sr.KENSHUIN of JICA ----------February
21. Dr. Tomita attended JICA Project Leaders' Conference ----------March
22. Mr. Sugawara, Machinery Expert, joined the Project ----------March
23. Donated vehicles & motor cycles were recived by Project--------March
24. The 1st seeding for Double Cropping (ultra early varieties) ---March

* OUTREACH SERVICE

1. Giving guidance and technical advice at the Shookry's Farm, Nosra, KFS Governorate ----------June
2. Contribution to MOA Machinery Exhibition at Nasr City ---------October
3. Harvest Demonstration at Sibylbay, Simila, Nosra & Dekernes ---November

KENSHU in Japan, 1982

1. Mr. Abd El Nagid Romeha ----------October
2. Dr. Ahmed Farid El Sahrigi ----------Feb.'83
3. Mr. Abd El Kawey Mohamed El Tanga ----------Mar/Nov.'83

HOME LEAVE of Japanese Experts

1. Mr. Y. Kimura ----------Dec.'82/Jan.'83
2. Mr. T. Namba ----------Feb./ Mar.'83
3. Mr. T. Naruse ----------Feb./ Mar.'83
4. Dr. T. Tomita ----------April/May'83

Annex b

ANNUAL PLAN OF AGRONOMY SECTION FOR 1983/84(Fob.'83to Jan.'84)

I. Different field triales and demonstration.

1. Double crop's trial (Plot No.14-19)

Double crop has been scheduled three differents seeding period as below;

First crop ; Seeding date = 15 Feb., 1 Mar. and 15 March.

Second crop : Seeding date = 15 June, 25 June and 5 July.

Variety : 1st crop=Akihikari, Second crop= Nihonbare

Fertilizer doses: 100 kgN, 60kgP_2O_5 and 30kgK_2O in each erop.

2. Demonstration of differents Japanese and Egyptian varieties(Plot No.9)

Varieties: i) Akihikari ii) Nihonbare iii) Reihoo
iv) Giza-172 v) IR-28

3. Comparative trial cum. demonstration of local(farmer's method) and mechanized transplanting method(Plot No.7 and 8)

To be compeared real existing farmer's method and mechanized transplanting method and it's yield differences by Reihoo or Giza-172.

4. Comparative trial cum demonstration of direct seeding and mechanized transplanting method (Plot No.10).

Variety : Reihoo

5. Trial for maximizing of grain yield

i) Akihikari (Japanese Variety)
ii) Nihonbare (" ")
iii) Reihoo (" ")
iv) Giza-172 (Egyptian variety)

This trial will be objected to maximizing the grain yield with most modanized and best rice culture operation by four different Japanese and Egyptian varieties.

Fertilizer doses: N : 150 kg / ha.
P : 80 " "
K : 30 " "

6. Fertilizer trial (Plot No. 11-13)

i) Different method of top-dressing

Treatment	Basal	1st TP	2nd TP
T-1	100%	0%	0%
T-2	50"	25"	25"
T-3	33"	33"	33"
T-4	0	50"	50"

ii) Trial of three fertilizer elements.

Treatment	N	P	K
T-1	80kg/ha	0	0
T-2	80 "	60kg/ha	0
T-3	80 "	60 "	30kg/ha
T-4	0	60 "	30 "
T-5	0	0	30 "

II. Main field preparation and interculture operation.

1. Application of basal fertilizer.
2. Application of top-dressing.
3. Application of Agril. chemicales.
4. Weeding
5. Irrigation.
6. Others

III. Observation of main field

1. Observation of growth pattern with different varieties.
   To identified the importants period as like as PIS, RD, etc.
2. Yield survey in different varieties.
   Survey of grain yield and yield components.
3. Compilation of data and results.
   To issur the technical note according to data and/or results.

IV. Observation of local (farmer's) rice cultivation technique.

1. Nursing technology : Seeding date, area of seedling bed, and duration of seedling etc.
2. Method of main land preparation: Cost for land preparation and plowing method.
3. Fertilizer application method : Fertilizer doses and time of application.
4. Cropping pattern of farmer's field
5. Yield observation in farmer's field: Grain production and yield components in farmer's field.

V. Training and extension activities.

ANNUAL PLAN FOR MECHANICAL SECTION
IN KALLIN AGRI. STATION
1983

DETAIL OF PLAN

I. PREPARATION OF PADDY FIELD

A. CHISEL PLOWING BY SMALL TRACTORS

B. ROTARY TILLER BY SMALL TRACTORS

C. PUDDLING AND LEVELLING BY SMALL TRACTORS

D. LEVELLING WITHOUT PUDDLING

E. HOW MANY TIME OF PUDDLING AGAINST TO DEPTH OF HARD PAN SOIL

2. TRANSPLANTING WORK BY TRANSPLANTERS

A. DEPTH OF PLANTING BY PRONT MOUNTED TYPE AND REAR MOUNTED TYPE

B. NUMBER OF MISSED SEEDLING PER HILL BY DIFFERENT PLANTING FINGERS

C. PLANTING ACCURACY BY FRONT MOUNTED TYPE AND REAR MOUNTED TYPE

D. ACCURACY OF SLIPPAGE RATE

E. SUITABLE TIME OF TRANSPLANTING AFTER PUDDLING COMPLETION

F. TRIAL TEST OF DIRECT SEEDING IN WET LAND CONDITION

3. EFFECT OF WEEDING CONTROL

A. HAND WEEDING

B. MACHINERY WEEDING

C. CHEMICAL WEEDING

D. NO TREATMENT

4. EFFICIENCY OF FARM MACHINERY UTILIZATION FOR DOUBLE CROP OF RICE

5. MACHINERY FOR HARVESTING

A. PERFORMANCE TEST

B. HEAD LOSS

C. LOSS OF GRAINS

D. DEMAGEL OF GRAINS

E. HARVESTING TIME BY DIFFERENT TYPE OF MACHINERY

6. COMPARISON OF LOCAL FARMING AND MECHNIZED METHOD

Annex d

Report of 1982 Budget (Japanese Side)

(From April 1982 to March 1983)

1) Dispatching Expert

(i) Long Term Expert (4 persons) ---------- 180,000 US

(ii)Short Term Expert(2 persons) ---------- 35,000 US

2) Donations ---------- 200,000 US

(i) Combines

(ii)Vehicles

(iii)Others

3) Kensyuin (3 persons) ---------- 20,000 US

4) Infrastructure ---------- 220,000 US

(Meet El Dyba)

5) Local Cost ---------- 20,000 US

Total 675,000 US

Note: Above Budget is roughly figured out and shown by round numbers.

Annex e

Budget for 1983 (Japanese Side)
(From April 1983 to March 1984)

1) Dispatching Expert	
(i) Long Term Expert (5 persons)	220,000 US
(ii)Short Term Expert(4 persons)	30,000 US
2) Donations	530,000 US
(i) Transplanters	
(ii) Combines	
(iii)Tractors	
(iv) Nursing Plant	
(v) Others	
3) Kensyuin (5 persons)	36,000 US
4) Grant Aid	5,200,000 US
(Meet El Dyba Center)	
5) Local Cost	20,000 US
Total	6,036,000 US

Note: Above budget is roughly figured out and shown by round numbers.

RICE MECHANIZATION PROJECT
in Arab Republic of Egypt
MOA – JICA

Workshop Bldg. MOA
Nady EL Seid St. Dokki
Giza — Cairo — Egypt
Telephone : 702543

مشروع ميكنـــة الارز
وزارة الزراعة/هيئة التعاون الدولي اليابانى
ادارة الورش
ش نادي الصيد – الدقي
الجيزة — القاهرة
تليفون ٧٠٢٥٤٣

MINUTES

THE 3RD JOINT COMMITTEE MEETING

R M P

EGYPT – JAPAN
(MOA) (JICA)

RICE MECHANIZATION PROJECT
in Arab Republic of Egypt
MOA – JICA

Workshop Bldg MOA
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مشروع ميكنـــة الارز
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ش نادي الصيد ـ الدقي
الجيزة ـــ القـاهرة
تليفون ٧٠٢٥٤٣

MINUTES OF THE THIRD JOINT COMMITTEE MEETING

1. The Third Joint Committee Meeting was held on February 12,1984 at the Workshop Building, Ministry of Agriculture, Dokki,Giza.

2. Attendants were:

   - Dr.A.El.Sahrigi - Dr.Z.El Haddad - Mr.Osama Kamel - Mr.A.ElSombaty
   - Mr.A.Doma - Dr.T.Tomita - Mr.S.Sugawara - Mr Namba -Mr.Y.Kimura
     Mr.T. Naruse - Mr. J.Koissumi.(as committee members)

   Observers were
   - Dr. A.El Hossary - Mr.I Nakai - Mr. Nahaz - Mr Moustafa A.
     Mr A. Tanga - Mr H. Emara - Mr M.Hamad

3. The meeting was co-chaired by Dr.El Sahrigi and Dr.Tomita

4. Resolutions of the meeting were as follows:

   a) The number of KENSHUIN of RMP should be increased up to 10 instead of 5 or 6 month training, by dispatching Egyptian counterparts to Japan for 3 months intensified training course, if possible.

   b) For data collection and analysis, the installation of a computer facility at Rice Mechanization Center was requested.

   c) Dr.Tomita and Mr.Naruse's extension were requested.

   d) Local Budget for 1984 was actually allocated (see Annex)

   e) The inauguration ceremony of Rice Mechanization Center will be held during the period from April to May 1984, in the presence of the Egyptian President, H.E.Minister of Agriculture, Japanese Ambassador, JICA Sr. Officials, and other VIPs.

   f) Brochure of RMC should be prepared including photos of Egyptian President, Egyptian Minister of Agriculture, Japanese Ambassador, and pictures of the RMC facilities. Introductory messages by both Egyptian Minister and Japanese Ambassador will be included.

   g) The status of RMC was set under the umbrella of Agricultural Mechanization Institute, Agricultural Research Center,Ministry of Agriculture.

Dr.Ahmad El Sahrigi
Project Director

Dr.Toyo Tomita
Team Leader

TEXT for the 3 rd JOINT COMMITTEE MEETING, RMP.

Contents:

Date & Place: Sunday 12 th. Fed-1984

RMP Cairo office at Workshop Bldg. MOA

§ 1 : Report of RMP activities in 1983

1. Bar Chart since Aug. 1981 up to Feb. 1984

2. Organization of RMP at Kallin (Phase I)

3. Technical Report

   Note: Refer to " The research Highlights in 1983 " and the Annual Report of 1983/84, which will be issued after the completion of 83' fiscal year.

4. Budget

Report of 1983 Budget (Japanese Side)

(From April 1983 to March 1984)

1. Dispatching Expert

(i)Long term expert (5 persons).....260,000 Us

(ii) Short term expert (3 persons).....27,000 Us

a. Soil and fertilizer 1 month

b. Economic analysis 2 months

c. Training 1 month

2. Donations .....350,000 Us

(i) Transplanters

(ii) Combines

(iii) Tractors

(iv) Nursing plant

(v) Others

3. Kenshuin (4 persons) .....30,000 Us

(i) Mr. Abd El Aziz Doma 1 month

(ii) Dr. Zakaria Haddad 2 Weeks

(iii) Mr. Mustafa Abbas 10 months

(iv) Mr. Hamdy Imara 9 months

4. Grant Aid .....5,200.000 Us

Meet El Dyba Rice Mechanization Center

5. Miscellaneous .....20,000 Us

Total 5,887,000 Us

Note : Above budget is roughly figured out and shown by round numbers

§ 2 : General Schedule of RWP for 1984

1. Bar Chart of Plan for 1984

2. Outline

3. Short Term Expert

4. KENSHUIN

5. Donation

6. Budget

Outline of Plan for 1984

(From April 1984 to March 1985)

1. Long Term Expert;
   1) Team Leader: Dr.Toyoo Tomita
      Note: His Assignment will be expired April 1984, extension is now under consideration.
   2) Agronomy Expert: Mr.Teruhisa Namba
   3) Agri. Machinery Expert: Mr.Yasuhiro Kimura
   4) Mechanization Expert: Mr.Seikichi Sugawara
   5) Coordinator: Mr.Takeshi Natuse
      Note: His Assignment will be expired February 1985.

2. Short Term Expert;
   Refer to the attached sheet " Plan of Short Term Expert for 1984"

3. KENSHUIN;
   Refer to the attached sheet " Plan of KENSHUIN for 1984 "

4. R.M.C. Schedule;
   Construction work will be completed by the end of March 1984. Therefore, the Hand Over Celemony might be taken place at the beginning of April 1984, and the real functions of the center and training will start after the moving from Kallin to Meet El Dyba and some preparation works.
   The Inauguration Celemony is also expected to be held sometime May 1984.

5. Donation;
   Refer to the attached sheet " Plan of Donation for 1984 " and the attached Donation Lists with A4 Form.

6. Joint Committee Meeting;
   The 4 th Joint Committee Meeting, Subject: Review of the Record of Discussion etc, will be held on the proper time in the presence of the Japanese Evaluation Team for RMP.

7. Others;
   Dispatching of the Evaluation Team is hopefully expected at the earliest time in 1984 fiscal year.

Plan of Short Term Expert for 1984

	Subject	Duration	Purpose
1	Weed Control in Paddy Field	3 months, From May 1984 to August 1984.	Weed control is one of the most important factors in Rice Mechanization to get the high yield and good quality rice. He is requested to recommend the suitable way for the said subject.
2	Land Reclamation (Design)	1 month, June 1984	Salinity is so high in the Meet El Dyba Project's Field that some experiments might be affected for its right data collection. He is requested to recommend the solution and its planning.
3	Land Reclamation (Execution)	6 months, From Oct.1984 to March 1985.	To execute the designed work which would be made by the Expert mentioned above.
4	Economic Analysis (Data Process)	6 months, From June 1984 to Nov.1984.	To analyze the data which have been collected from the previous experiments and trials, and to recommend the most economical system of Rice Mechanization in Egypt, data process through Micro Computor is requested.

Plan of Kensyuin for 1984

	Nominee	Course and Duration	Purpose
1	Mr. Nuru Saleh Counterpart in Mechanization Div.	Individual, 6 months From April 1984 to September 1984	To enrich his knowledge about rice mechanization through the study of the large scale rice mechanization at Hachirogata in Japan.
2	Mr. Ahmed Ahtiyal Counterpart in Field Control Div.	Individual, 2 months From May 1984 to July 84	To enrich his knowledge specially about the Weed Control in the paddy field at an Agriculture Experimental Station in Japan.
3	Mr. Mahmud Naiem Counterpart in Machinery Div.	Group Course, 7 months (Agri. Machinery Maintenance and Repair) From June 1984 to Dec.84	To enrich his knowledge about the subject of the said training course in Japan.
4	Mr. Ala Sonbaty General Director of M.O.A., K.F.S.	Individual, 2 weeks June 1984	For understanding of the real rice mechanization system in Japan through observations.
5	Mr. Osama Kamel Site Manager of RMC, RMP Coordinator	Individual, 1 month October 1984	For understanding of the Organization and Management of the Tsukuba International Training Center, JICA in Japan.
6	Mr. Ibrahim Nuru Counterpart in Machinery Div.	Group Course, 10 months (Rice Production Mechanization) From Feb.1985 to Nov.85	To enrich his knowledge to be an expert in the said subject.
7	Mr. Samir Kedre Counterpart in Agronomy Div.	Group Course, 9 months (Rice Cultivation) From March 1985 to Oct.85	To enrich his knowledge to be an expert in the said subject.

Note : Final acceptance will be decided at the JICA Headquaters.

Plan of Donation for 1984

The Rice Mechanization Project was started in August 1981, and RMP has developed and is at the transitional stage.

Together with the social problems, importance of the rice mechanization is recognized as the top priority by the Government of Egypt. Therefore, RMP activities are highly expected to produce fruitful results for Egyptian farmers.

By the reasons mentioned above, it seems to be quite necessary that various functions of RMP such as the experiments, and applied trials have to be strengthened and developed when the Rice Mechanization Center is launched at Meet El Dyba, KFS Governorate, April '984.

Donation Items for 1984 are selected on the basis of the view point of RMC's establishment and RMP's completion through the mutual consultation with the Japanese Experts and the Egyptian Counterparts.

Major Donation Items;
(Refer to the attached list)

1. Farm Machinery
   a) Large Size Combine
   b) Seed Drill
   c) Reaper
   d) Irrigation Pump
   e) Rice Milling Machine
   f) Others
2. Chemicals
3. Laboratory Equipments
4. Office Equipments
5. Others

Note: Final selection might be modified by JICA in Japan.

DONATION ITEM FOR 1984 PROJECT ACTIVITIES

AGRICULTURAL MACHINERY

No.	Description	Quantity
1.	Combine	1
2.	Seed Drill	1
3.	Rotary Seeder	1
4.	Combine (up-threshing type)	1
5.	Reaper	1
6.	Reaper mounted on transplanter	1
7.	Water pump 10x 10"	1
8.	Sub Soiler	1
9.	Rotary	1
10.	Rice milling Machine	1
11.	Dryer	2
12.	Hay baler	1
13.	Micro bus	1
14.	Jeep	2
15.	Motor Cycle	10
16.	Spare parts for tractor	1599 pcs
17.	Spare parts for transplanter	15 "
18.	Others	

LABORATORY EQUIPMENTS

1.	Green leaf area meter	1 set
2.	Kjeldahl nitrogen quick digester, vapor-still, and aut-linkage titrator system	1 "
3.	Microscope 20 x - 60 x	3 "
4.	Water stills	1 "
5.	Plant crusher	1 "
6.	Portable pH meter	3 "
7.	Microscope 1500x	3 "
8.	Hand tally counter	3 "
9.	Nematode detection set	1 "
10.	High pressure soil sterilizers	1 "
11.	Bottle shaker	1 "
12.	Spot projecter	2 "
13.	Long recording thermo-hygrograph	1 "
14.	Bimetallic sunshine recorder	1 "
15.	Sunshine cutting net	20 rol.
16.	Ground sheet	20 nos.
17.	Antinomater	1 set
18.	Plant heliograph recorder	1 set

AGRICULTURE CHEMICAL

1.	Tachigaren	50 litter.
2.	Dakoneel (WP)	60 kg.
3.	Pan-soil	10 l.
4.	Orizemeit	300 kg
5.	Hinozan	60 l.
6.	MO-granule	300 kg.
7.	Grass-gin (WP)	120 kg.
8.	Satren-S	240 kg.
9.	Diazinon-O	400 kg.
10.	Diazinon WP	50 kg.
11.	Benreet-T	10 kg.
12.	Kalper	200 kg.

Office Equipment

1.	Steel Book Shelf	3 sets
2.	Steel Book Shelf with slide door	3 sets
3.	Base for Steel Book Shelf	3 sets
4.	Money Safe	1 no.
5.	Letter Case	5 nos.
6.	Pumphlet Case, A4 size	1 set
7.	Pumphlet Case, B4 size	1 set
8.	Key Box	1 no.
9.	Black Board with section	1 set
10.	Information Board, large size	1 set
11.	Information Board, small size	1 set
12.	Stand Ladder	1 set
13.	Cart	1 no.
14.	Pingpong Table	2 sets
15.	File, some sizes	100 nos.
16.	Stepler	6 nos.
17.	Punch, large size	1 no.
18.	Punch	3 nos.
19.	Paper cutter, extra strong	1 set
20.	Paper cutter, large size	1 set
21.	Paper cutter, small size	1 set
22.	Book Stand	10 nos.
23.	Tray	5 nos.
24.	Counter, handy type	1 no.
25.	Tosha Fax, 220 V	1 set
26.	Printer, 220 V	1 set
27.	Electric Typewriter, English	1 set
28.	Electric Typewriter, Arabic	1 set

Budget Plan for 1984 (Japanese Side)
(From April 1984 to March 1985)

1) Dispatching Expert

(i) Long Term Expert (5 persons) ---------- 260,000 US

(ii) Short Term Expert (4 persons) ---------- 80,000 US

<1> Weed Control, 3 months

<2> Land Reclamation (Planning), 1 month

<3> Economic Analysis, 6 months

<4> Land Reclamation (Excution), 6 months

2) Donations ---------- 350,000 US

(i) Large Size Combine

(ii) Reaper

(iii) Milling Machine

(iv) Drying Machine

(v) Others

3) Kenshuin (7 persons) ---------- 50,000 US

<1> Mr. Nuru Saleh, 6 months

<2> Mr. Mahmud Naiem, 7 months

<3> Mr. Ahmed Ahtiyal, 2 months

<4> Mr. Ala Sonbaty, 2 weeks

<5> Mr. Osama Kamel, 1 month

<6> Mr. Ibrahim Nuru, 10 months

<7> Mr. Samir Kedre, 9 months

4) Infrastructure (Land Reclamation) ---------- 220,000 US

5) Miscellaneous ---------- 20,000 US

Total 980,000 US

Note : Above budget is roughly figured out and shown by round numbe s.

PROPOSED ITEMS AND BUDGET
FOR
RICE MECHANIZATION CENTER AT MEET EL DEBA

On Part of the Mechanization Research Institute(Agricultural Research Center)

Operative Expenses		LE
1.	Fuel,Oil and Lubricants (Agri.Machinery-Vehicles)	15,000
2.	Office Supplies (Paper-Photocopy machine, Typwriters)	10,000
3.	Consumption (Water-Electricity,Communications	6,000
4.	Agricultural Materials (Raw materials,Field equip.cleaners.	8,000
5.	Spare Parts (Vehicles-Agri.Euip.-Workshop Operative resources)	12,000
6.	Seasonal Labour- and Current Expenditures (Field Agri.,Meet El Deba and Kellin)	11,000
7.	Kitchen and Cleaning equipment	2,000
8.	Customs clearance expenses	15,000
9.	Cafeteria	10,000
10.	Extra wages and incentives	10,000
	Total	99,000

The above are estimated costs

FLOW CHART OF R.M.P.(R.M.C.)

R.M.P CAIRO

(EMBASSY OF JAPAN)
Mr. O. Nakai
Mr. . Kato

(JICA CAIRO)
Mr. J. Koizumi
Mr. S. Matsuura

(RMP CAIRO, JICA)
Dr. T. Tomita
Mr. T. Maruse

Staff;
Secretary 1
Driver 1

(MOA)
Dr.Ahmed Sahrigi (D.G. of Agri.Mech.Projects)
Dr.Zakaria Haddad (Dep. Director)
Mr.Osama Kamel (RMP Coordinator)

Staff;(RMP.MOA)

Assistant	4
Accountant	2
Typist	1
Driver	1

R.M.C. MEET EL DYBA

Japanese Experts
- Dr.Toyoo Tomita (Team Leader)
- Mr.Seikichi Sugawara (Mechanization)
- Mr.Teruhisa Namba (Agronomy)
- Mr.Yasuhiro Kimura (Machinery)
- Mr.Takeshi Naruse (Coordinator)

Site Manager of R.M.C.
Mr.Osama Kamel

Deputy Manager
Mr.Aziz Doma
(Director at Kallin)

(MOA.Kafr El Sheikh)
Mr.Ala El Sonbaty
Head of Agri.Affairs

K.F.S. GOVERNORATE

Agricultural Organizations
- Cooperative
- Experimental Station
- Demonstration Farm
- Others

Training

Administration Dep.

Activities;
- Finance
- Facility Maintenance
- Car Control
- Domitory
- Cafeteria
- Secretary
- Others

Staff;
Accountant
Engineer
Driver
Domitory Keeper
Servant
Cook
Secretary
Typist
Watchman
Others

Agronomy Div.

Activities;
- Trial and Demonstration
- Field Survey
- Training

Staff;

Agronomy Dep.

Activities;
- Nursery Preparation
- Seed Production
- Water Control
- Weed Control
- Fertilization
- Pest Control
- Others

Scaff;

Production & Field Control Div.

Machinery Div.

Activities;
- Land Preparation
- Transplanting
- Direct Seeding
- Weed Control
- Combine
- Post Harvest
- Modification
- Workshop

Staff;

Machinery & Mechanization Dep.

Activities;
- Agronomic Trial
- Mechanical Trial
- Surveying
- Training

Staff;

Mechanization Div.

Activities;
- Information
- Others

Staff;

Public Relation Div.

Basic Activities of Administration Dept. for 1984

1. Finance;

   Cover all financial matters,

   (1) Salary for Egyptian Staffs
   (2) Running Cost of RMP and RMC
   (3) Custum Duties of Donations and Project Cars
   (4) Cafeteria
   (5) Miscellaneous

2. Facility Maintenance;

   Maintenance of Building and Facilities of RMC,

   (1) Electorisity Supply
   (2) Water Supply
   (3) Telephone
   (4) Security
   (5) Others

3. Car Control;

   Cover all affairs related to Project Cars,

   (1) Car Allocation and Control
   (2) Driver Allocation and Control

4. Dormitory;

   Cover all affairs related to Dormitory,

   (1) Superintending Trainees in accordance with the Interial Regulation of the Dormitory.
   (2) Room Cleaning
   (3) Others

5. Cafeteria;

   Cover all affairs related to the management of the Cafeteria,

   (1) Feeding for Trainees
   (2) Purchase of materials and food stuff
   (3) Others

6. Secretary;

   Cover all clerical works,

   (1) Reception
   (2) Information and Communication
   (3) Documentation
   (4) Others

ACTIVITIES OF AGRONOMY DEPERTMENT IN 1984

AGRONOMY DIV.

I. Trial and demonstration activities

1. Fertilizer trial : Six different trials.
2. Cropping season trial: One trial.
3. Cultivation trial : Eight different trials.
4. Demonstration : Four different demonstration in Meet El Dyba and Kallin field.

II. Survey of local rice cultivation techniques and grain yield in farmer's field.

III. Training activities.

PRODUCTION AND FIELD CONTROL DIV.

1. Nursery preparation and necessary material control.
2. Production of high quality seeds of rice.
3. Water control of all Meet El Dyba field.
4. Weed control.
5. Fertilizer application to all Meet El Dyba field and control.
6. Diseases and insects control of all Meet El Dyba field.
7. Maintenance of irrigation canal,drainage canal, farm road, etc.
8. Cultivation and control of winter crops.

WORKING PLAN OF MACHINERY AND MECHANIZATION DEPT. FOR 1984

Machinery Division

1. Land Preparation;
   Comparative studies between chisel plowing and rotary plowing in connection with puddling & levelling.
2. Transplanting;
   (1) Performance tests on transplanters.
   (joint test with Mechanization Div.)
   (2) Syncronized fertilization together with transplanting.
3. Direct Seeding;
   Comparative trials between the drill seeding in dry condition and wet condition.
   (joint test with Agronomy Div.)
4. Weed Control;
   Trial of Mechanical Weeding.
5. Combine;
   Performance test on harvesting machine.
   (joint test with Mechanization Div.)
6. Grain Dryer and Milling Machine;
   (1) Performance test of grain dryer.
   (2) Performance test of Milling Machine.
   (Above two tests are jointly carried out with Mechanization Div.)
7. Modification, Design and Manufacture;
   (1) Design and Manufacture of fertilizer hopper in connection with 2 - (2).
   (2) Design and Manufacture of rotary weeder in connection with 4.
   (3) Modification of threshing device to decrease chaff.
8. Workshop;
   (1) Data collection of individual machine for maintenance.
   (2) Preparation of workshop manual.
   (3) Preparation of operation manual.

Mechanization Division

1. Applied Agronomic Trials;
   (1) Trial on working duration of rice transplanting.
   (2) Trial on pH adjustment.
   (3) Trial on seed quantity and plant density.
   (4) Trial on damping off diseases.
   (5) Trial on direct seeding and its economic study.
   (6) Trial on herbicide application.
   (7) Study on lodging degree of rice plant and its relation between moisture ratio and loss ratio in paddy.
   (8) Study on soil and irrigation water in KFS concerning pH and EC.

2. Applied Mechanical Trials;
   (1) Performance test on transplanter.
   (joint test with Machinery Div.)
   (2) Performance test on harvesting machine.
   (joint test with Machinery Div.)
   (3) Performance test on grain dryer and milling machine.
   (joint test with Machinery Div.)

3. Surveying;
   (1) Survey on general farming in KFS.
   (2) Survey on rice cultivation stage and working hours.
   (3) Data analysis (with micro computer)
   Note: Micro Computer is now under consideration as a donation item which might be accompanied with the Short Term Expert (Economic Analysis).

4. Training;
   (1) Preparation of practical plan and curriculum for each category of training course.
   (2) Conduct of training.
   (3) Edition of text book for training.
   Note: Detailed training plan is attached herewith.

5. Information (Public Relation Div.) ;
   (1) Orrientation and guide for visitors.
   (2) Issueing pamphlets.
   (3) Audio-Visual education.

Master Plan of Rice Mechanization Training (1984 to 1986)

No.	Kind of Course	1984	1985	1986	No. of Trainee	Remark
1	Basic Mechaniza-tion Course	(day) (time)(men)(man.day) 12 x 15 x 24 = 4320 180 days	12 x 15 x 16 = 2880 180 days	12 x 15 x 12 = 2160 180 days	780 men	Trainee have to be selected by MOA.
2	Basic Rice Cultivation Course	10 x 2 x 8 = 160 20 days	12 x 2 x 8 = 192 24 days	12 x 2 x 12 = 288 24 days	32 men	
3	Advanced Mechanization Course		12 x 15 x 8 = 1440 180 days	12 x 12 x 12 = 1728 144 days	120 men	Trainee have to be selected by MOA, who has one year field experience after graduation of Basic Course.
4	Advanced Rice Cultivation Course		8 x 3 x 8 = 192 24 days	12 x 8 x 12 = 1152 96 days	24 men	
	No. of Trainee	376 men	400 men	444 men	1220 men	
	Ratio of man x days (%)	64 %	57 %	76 %		
	Ratio of Training Duy No. (%)	68 %	138.8 %	151 %		

Note: Max. Training Day No. is 294 in 1984 (Friday: 52 days & National Holiday: 19 Days)

Outline of Training Periods for 1984

1984

	April			May			June			July			August			September			October			November		
	B	M	E	B	M	E	B	M	E	B	M	E	B	M	E	B	M	E	B	M	E	B	M	E
Basic Mechanization Course												1	2		3	4			5		6	7		8
Basic Rice Cultivation Course																								

	1985 December			January			February			March		
	B	M	E	B	M	E	B	M	E	B	M	E
Basic Mechanization Course	9			10		11	12		13	14		15
Basic Rice Cultivation Course												

Remark

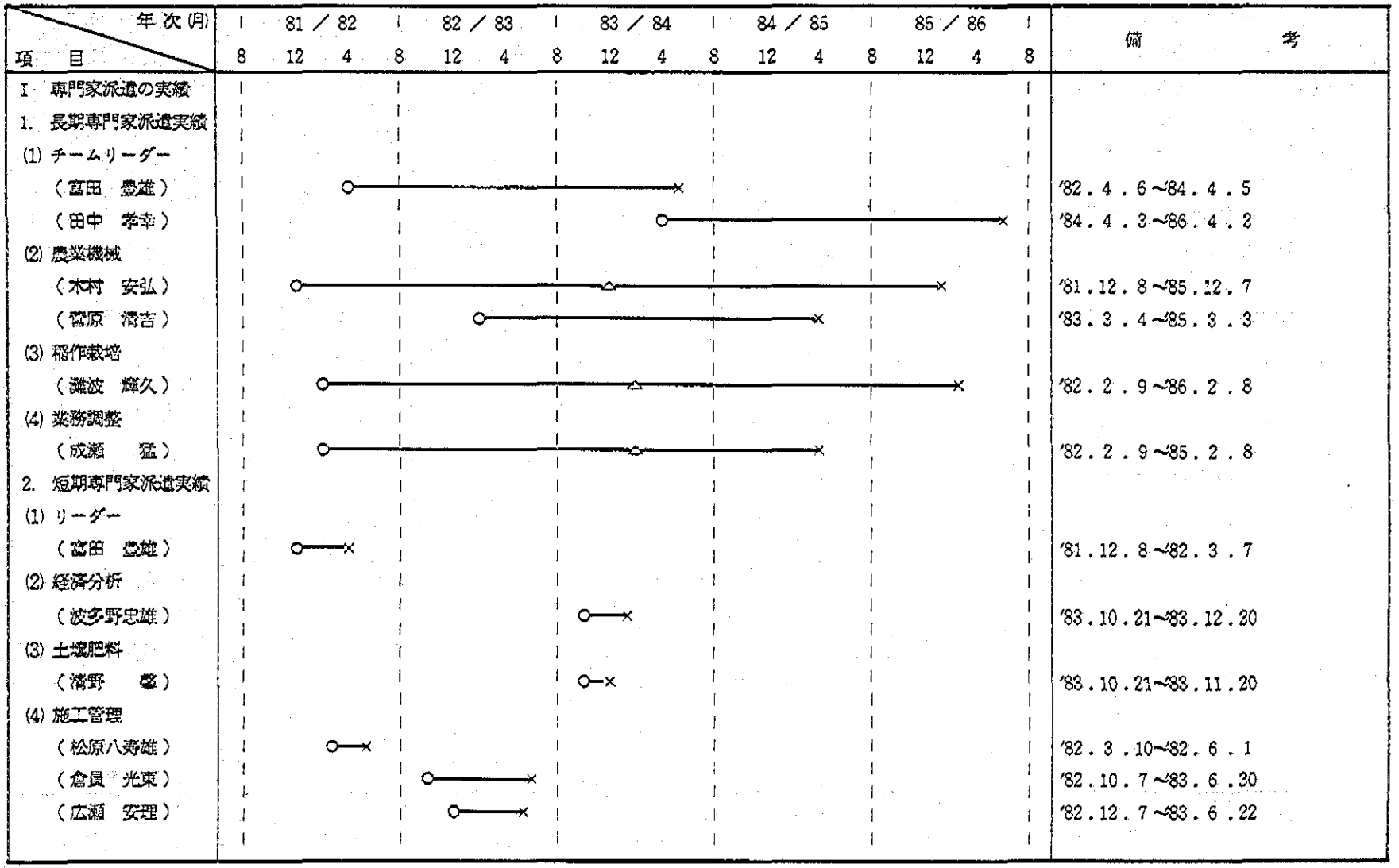
1. Training is stopped on April, May, June, because of labour peak season.

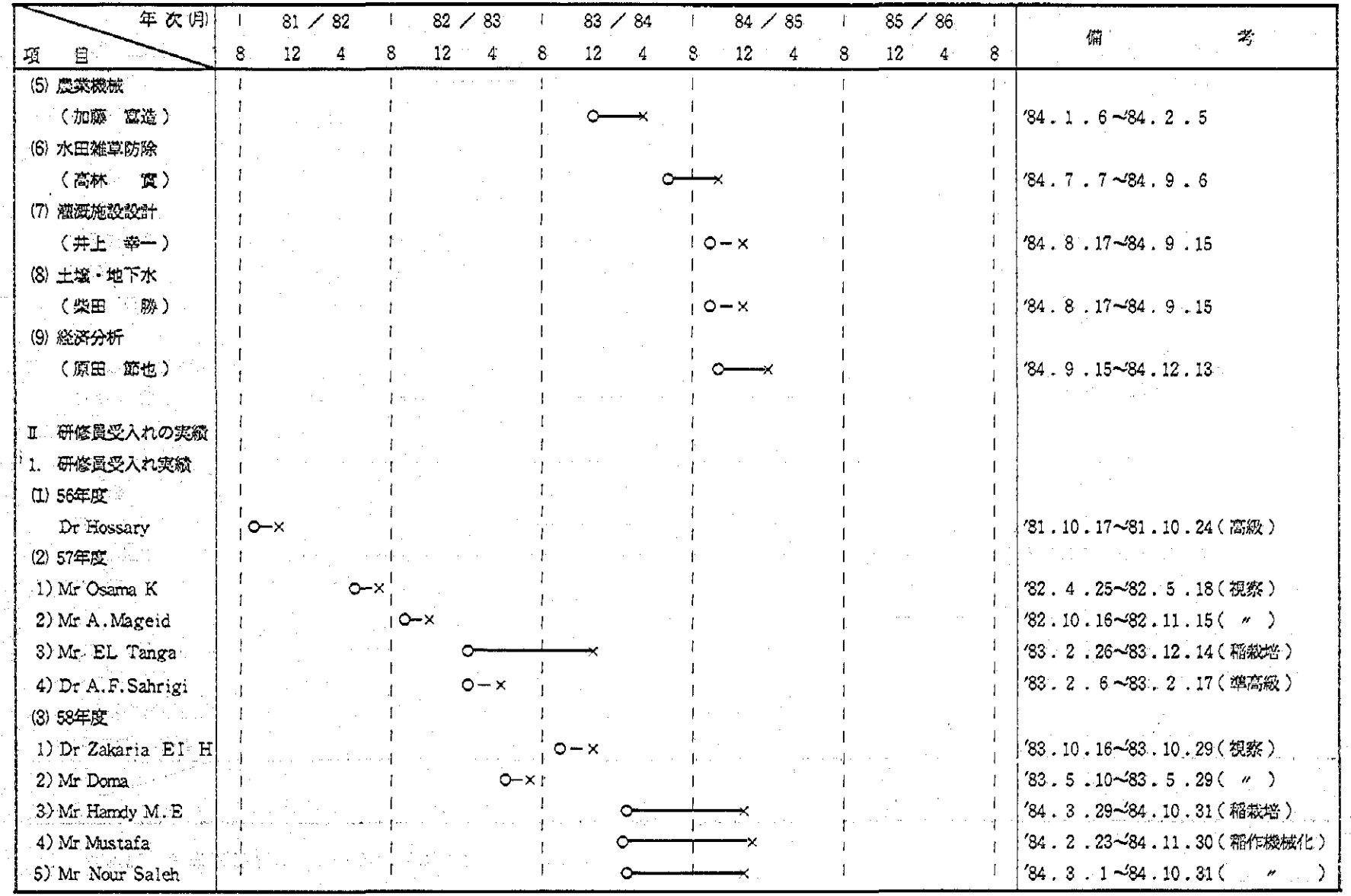
2. Exact data of training should be determined through the detail check by instructor themselves.

Annex 3

専門家，研修員受入れ，機械供与実績

2. 専門家，研修員受入れ，機材供与各実績




年次(月)
項目
81 / 82
82 / 83
83 / 84
84 / 85
85 / 86
8 12 4 8 12 4 8 12 4 8 12 4 8 12 4 8
備考
(5) 農業機械
（加藤 富造）
'84．1．6～'84．2．5
(6) 水田雑草防除
（高林 實）
'84．7．7～'84．9．6
(7) 灌漑施設設計
（井上 幸一）
'84．8．17～'84．9．15
(8) 土壌・地下水
（柴田 勝）
'84．8．17～'84．9．15
(9) 経済分析
（原田 節也）
'84．9．15～'84．12．13
Ⅱ 研修員受入れの実績
1. 研修員受入れ実績
(1) 56年度
Dr Hossary
'81．10．17～'81．10．24（高級）
(2) 57年度
1) Mr Osama K
'82．4．25～'82．5．18（視察）
2) Mr A.Mageid
'82．10．16～'82．11．15（〃）
3) Mr. EL Tanga
'83．2．26～'83．12．14（稲栽培）
4) Dr A.F.Sahrigi
'83．2．6～'83．2．17（準高級）
(3) 58年度
1) Dr Zakaria El H
'83．10．16～'83．10．29（視察）
2) Mr Doma
'83．5．10～'83．5．29（〃）
3) Mr Hamdy M.E
'84．3．29～'84．10．31（稲栽培）
4) Mr Mustafa
'84．2．23～'84．11．30（稲作機械化）
5) Mr Nour Saleh
'84．3．1～'84．10．31（〃）

項目＼年次(月)	81／82 8	12	4	82／83 8	12	4	83／84 8	12	4	84／85 8	12	4	85／86 8	12	4	8	備考
(4) 59年度																	
1) Mr EL Sonbaty									○—×								'84．7．9～'84．7．25（準高級）
2) Mr A.M.Ahtiyal									○	+	×						'84．6．28～'84．8．31（水田雑草）
3) Mr M.Bideer									○		×						'84．6．14～'84．12．22
Ⅲ 機材供与の実績と計画	a) トラクター b) 田植機 c) スプレーヤー d) 動力噴霧機 e) かんがい用ポンプ f) ワークショップ機材（六角レンジ他） g) 作業用ゴム長ぐつ他 h) 水稲種子 i) 農薬（ダイアジノン他） j) 育苗機材（育苗箱他） k) 百葉箱，自己温度計他 l) 謄写ファックス m) 記録計等消耗品一式他			a) コンバイン b) バインダー c) 脱穀機 d) 籾摺り，精米機 e) トラック・ステーションワゴン f) マイクロバス・ジープ g) オートバイ，溶接機 h) タイプライター・コピー機 i) スライド映写機，映写用スクリーン，トラクター j) 16㎜映写機他 k) 冷蔵庫，エアコン l) 農薬（ダイアジノン）他 m) 稔実歩合測定器 n) 事務機材他			a) リーパー収穫機 b) 小型ブルドーザー c) トラクター d) ポンプ e) 播種プラント f) 育苗コンベア他 g) 砕土，ふるい機他 h) 一輪車 i) 田植機，コンバイン j) ハーベスター k) トレーラー，ドリル，シーダー l) 噴霧機，代かきロータリー m) ブロードキャスター n) グレーダーロータ一 o) 乾燥機，アルミブリッジ p) スペアパーツ r) 水稲収穫収量診断器 s) 上皿棒秤 t) 事務機器他			a) 顕微鏡 b) 蒸留機 c) N分解装置 d) 葉面積測定器 e) PH メーター f) マイクロバス g) ジープ h) オートバイ i) コンバイン j) 条播機 k) 収穫機（リッパー） l) 揚水ポンプ m) 精米機 n) 乾燥機 o) 除草剤 p) 病害虫防除剤 q) トラクター等2ペアパーツ他						
	29,846千円			44,730千円			87,000千円			73,000千円							

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