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RICE FARMER'S RESPONSE TO THE INTRODUCTION OF INTERMEDIATE TECHNOLOGY (TABLE THRESHERS, ROW SEEDERS, AND GRAIN CLEANERS) IN THE LAND REFORM AREA OF NUEVA ECIJA

by

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E R R A T A

Page 1, paragraph 1, line 3 - exists to read exist

Page 2, Table 1, column 1, No. 13 - Caranglan to read Carranglan

Page 7, Table 6, column 5, lines 4 & 5 - (Percent) 45 & 45 to read 4.5 & 4.5

Page 14, Table 21 - total responses 48 to read 42
_____, paragraph 1, line 2 - Delete comma after wet fields

Page 16, Table 24, lines 3 & 5 - (Percent) 75 & 25 to read 7.5 & 2.5
_____, footnote - refers to read refer

Page 17, Table 26 - first total 38 to read 39, and total responses 46 to read 47

_____, Table 27 - first total 27 to read 23, and total responses 52 to read 48

Page 19, paragraph 2, line 3 - utilize to read utilized

Page 20, paragraph 2, line 2, - who landlored to read whose landlord

_____, Table 30 - other possible uses to read other possible use

Page 22, Table 33 - first total 7 to read 8, and total responses 42 to read 43

Page 30, Table 44 - total 30 to read 31

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by Lorna P. Domingo*

The introduction of improved rice varieties has tended to increase the seasonal demand for labor, particularly in those tasks for which there exists few or no alternatives to traditional cultural techniques. Lack of suitable improvements in these tasks has resulted in the emergence of a number of production constraints which impede further intensification of cropping, thus lessening optimal returns for farmers.[1]

Labor inputs presently constitute the largest cash cost in the production of rice. The increase in minimum wage for agricultural labor has also tended to augment the shares of total cash outlays going to labor. This creates an atmosphere within which an intermediate technology which will reduce costs or increase output and revenues becomes highly desirable.[2]

In response to this emerging need, the International Rice Research Institute (IRRI) is developing a number of machines, the table thresher, the seeder, and the grain cleaner, which are capable of providing increased labor productivity with low investment requirements without concomitant large-scale labor displacement or high operational costs.

The National Science Development Board (NSDB), through the Director of the Nueva Ecija Land Reform Integrated Development Program (NELRIDP) and in cooperation with the IRRI and the United States Agency for International Development (USAID), has launched a pilot program for the evaluation and testing of improved agricultural machinery designs in the land reform area of Nueva Ecija.

This social research study is a follow-up of the above-mentioned pilot program. The objectives of this study are: (1) to document and analyze the reactions of those who have tried and/or witnessed the operation of the intermediate technology, (2) to identify the variables or factors in the adoption of this kind of innovation, (3) to find out whether the existing cooperatives are effective avenues for introducing this technology, and (4) to provide a basis for formulating policies in the implementation of such kind of pilot programs.

This study covers two cropping seasons, the wet and the dry, in order to evaluate the performance of the table threshers in two different seasons.

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[1] Project Proposal on a Pilot Program for the Evaluation and Testing of Improved Agricultural Machinery Designs in the Land Reform Area of Nueva Ecija, p. 2-3.

[2] Ibid., p. 3.

Table thresher distribution

Twenty table thresher were purposely manufactured for the pilot program on evaluation and testing of improved machinery designs. Ten FACOMs were invited to participate in the pilot program. Before the table thresher were delivered to them, they were asked to send their selected representatives to be trained as operators.

At the start of the project, in dry season 1972, the FACOMs were supposed to have been sent two table thresher each, but one FACOM did not accept the delivery and three FACOMs accepted only one. Two table thresher rejected by the FACOMs were channeled to the Central Luzon State University (CLSU), and to private individuals who were interested to try it. The private individuals were an employee of NELRIDP and his neighbors, who were all owner-operators.

Table 1. Distribution of table thresher.

Place delivered	Dry '72[a]			Wet '72[a]		
	No. of TTs delivered	No. of TTs actually used	No. of users	No. of TTs delivered	No. of TTs actually used	No. of users
1. Cuyapo	2	1	1	1	1	1
2. Guimba	2	2	5	2	1	2
3. Muñoz	1	0	0	0	0	0
4. San Jose City	2	1	3	1	1	1
5. Rizal	2	trial only		1	0	0
6. Gen. Natividad	2	2	5	2	0	0
7. Cabanatuan City	1	1	0	1	0	0
8. San Leonardo	2	1	3	2	0	0
9. Sta. Rosa	1	0	0	0	0	0
10. Gen. Ricarte	borrowed	1	1	1	0	0
11. Private institution or individual	2	2	5	2	2	3
12. Talavera	-	-	-	6	0	6*
13. Caranglan	-	-	-	1	1	1*
14. Undelivered	3	0	0	0	0	0
Total	20	11	23	20	12	14

*New users

a/Dry or wet refers to the harvest season.

Table 1 reveals that the number of table thresher used increased by two from dry to wet season but the number of users decreased by nine. Among the 14 users in the wet season, eight were new, majority of them came from one barrio cooperative, and six were old.

Of the 23 users in the dry season only six used the table thresher again in the wet season. Only one, the manager of Cuyapo FACOM, signified

his intention of buying a table thresher. The rest would like to use the table threshers again in the wet season but not in the dry season when tilyadoras are available.

Why Cabiao FACOMA rejected delivery of the table thresher

The trained operator from Cabiao recommended to the FACOMA to get one table thresher. The FACOMA officials and members met to discuss the matter. The labor force segment of the community was represented, since majority of the farmers here hired labor to do harvesting, threshing, and winnowing separately. The representative of the labor force opposed the acquisition of a table thresher because it would surely decrease their earnings, if not displace them. The manager himself said that he would utilize available family labor if there was a table thresher. Peace and order situation in the locality was bad as mentioned by the FACOMA manager; the hired laborers might steal the motor of the table thresher or most likely sabotage the whole machine.

Of the 17 table threshers delivered, only 10 or 59 percent, were tried and used. Table threshers delivered to Muñoz and Sta. Rosa FACOMAs were never tried and some never got beyond the trial stage. Managers or other officers of the FACOMAs concerned were interviewed to find out the reasons for the non-use of the machine.

Why table threshers delivered to Muñoz and Sta. Rosa FACOMAs were never tried

When the table thresher was delivered to Muñoz FACOMA, there was a turnover of managership and the trained operator moved to another place. Promotion or announcement of the table thresher to the FACOMA members was never attended to. Besides, this FACOMA owned a tilyadora to service the members at four percent rate.

The table thresher in Sta. Rosa FACOMA was never tried because the manager said it failed to start when they were about to operate it in their warehouse. Also, no members could have used it, for they did not have any harvest at that time because of tungro.

Why some table threshers never got beyond trial stage

Before the table threshers were delivered, some officers of the different FACOMAs had already been informed of their operation and efficiency by the trained operators.

Upon trial in the FACOMA compounds or in the homes of some members, they found out that: the table thresher was hard to transport because it was heavy, unstable, and there was no sufficient area to hold on; threshed palay from it still needed cleaning or winnowing; the operator and feeders got itchy all over their bodies, especially their faces because they got covered with palay dust; the table thresher choked when a feeder accidentally released a bundle of palay; and its threshing capacity was very much lower than that of the tilyadora.

Row seeder and grain cleaner distribution

Eleven units of row seeders were used in one city and in 14 municipalities (Table 1a). No fee was charged for their use, for they all served

as demonstration units. In five towns the FACOMAs were instrumental in selecting the farmer cooperators, while the rest of the cooperators were contacted by Engineer Medardo Roxas. In eight of these places table threshers had also been used.

Table 1a. Places where row seeders were used.

Place where used	No. of users	
	Dry[b/]	Wet[b/]
1. Balcc	1	
2. Bongabong		1
3. Cabanatuan City		6
4. Cabiao	1	
5. Cuyapo		1
6. Carranglan	1	
7. Gen. Natividad	4	1
8. Guimba	1	
9. Llanera		1
10. Rizal	1	
11. Muñoz	3	
12. Quezon		1
13. San Leonardo		1
14. Talavera		1
15. Rio Rico	1	
TOTAL	13	13

[b/] Dry or wet refers to the planting season.

A grain cleaner was with the San Leonardo FACOMA and another with the Cabanatuan City FACOMA. Only the one in San Leonardo was used. A plan to transfer the unused cleaner from Cabanatuan City to San Jose City FACOMA did not materialize because according to the FACOMA manager, grain cleaning was not practiced by farmers in this city; they preferred tilyadoras with defective blowers which did not remove the unfilled grains and therefore, added to the weight of their threshed palay.

Characteristics of the respondents

Respondents of this study were from two cities and 13 municipalities. A total of 32 respondents used the table threshers, 23 used the row seeders, and eight witnessed the operation of the table threshers (Table 2). Representatives of four FACOMA rejectors were interviewed to get their reasons for the non-acceptance or non-use of table threshers.

Among the respondents, 63 in all, the youngest was 21 years of age and the oldest was 70. Many of them (33 percent) fell under the age range of 41-50 years and the majority were within 31 to 60 years old (Table 3).

Table 4 shows that only one out of 63, or one percent, had no education. Eleven percent reached the primary grades and 43 percent finished

the elementary school. Twenty-four percent reached or finished high school and 21 percent were college graduates. The average education attained was 8.03 years.

Table 2. Distribution of respondents.

Place of residence	No. of users		No. of observers
	Table thresher	Row seeder	Table thresher
1. Llanera	1	1	1
2. San Jose City	4		
3. San Leonardo	3	1	
4. Cuyapo	1	1	2
5. Gen. Natividad	5	5	1
6. Guimba	6	1	
7. Cabanatuan City		4	2
8. Muñoz	6	3	1
9. Rizal		1	1
10. Baloc		1	
11. Bongabong		1	
12. Cabiao		1	
13. Carranglan		1	
14. Quezon		1	
15. Talavera	6	1	
TOTAL	32	23	8

Table 3. Age range of respondents.

Age range	Table thresher respondents		Row seeder respondents		Total	
	No.	Percent	No.	Percent	No.	Percent
21-30 years	6	15	1	4	7	11
31-40 "	12	30	8	35	20	32
41-50 "	14	35	7	31	21	33
51-60 "	7	17.5	6	26	13	21
61-70 "	1	2.5	1	4	2	3
TOTAL	40	100	23	100	63	100

Average age - 43.09 years

Table 4. Educational attainment of respondents.

Educational attainment	Table thresher respondents		Row seeder respondents		Total	
	No.	Percent	No.	Percent	No.	Percent
None	1	2.5			1	1
Primary	3	7.5	4	17	7	11
Intermediate	18	45	9	39	27	43
Secondary	13	32.5	2	9	15	24
College	5	12.5	8	35	13	21
TOTAL	40	100	23	100	63	100

Average educational attainment - 8.03 years

Majority of the respondents, 76 percent, were farmers; 19 percent were government employees and farmers at the same time; and 3, or five percent, were full-time government employees (Table 5). Many of the farmers, 38 percent, had been farming from one to ten years, 27 percent from 11 to 20 years, 24 percent from 21 to 30 years, and 51 years was the longest time a farmer had been farming. The average years in farming was 16.35 (Table 6).

Table 5. Occupation of respondents.

Occupation	Table-thresher respondents		Row-seeder respondents		Total	
	No.	Percent	No.	Percent	No.	Percent
Farmer	31	77.5	17	74	48	76
Government employee	2	5	1	4	3	5
Farmer & gov't employee	7	17.5	5	22	12	19
TOTAL	40	100	23	100	63	100

Table 6. Number of years respondents have been farming.

Years range of farming	Table-thresher respondents		Row-seeder respondents		Total	
	No.	Percent	No.	Percent	No.	Percent
1-10 years	15	37.5	9	39	24	38
11-20 "	11	27.5	6	26	17	27
21-30 "	9	22.5	6	26	15	24
31-40 "	2	5	1	45	2	3
41 and above					1	2
No response	1	2.5	1	45	2	3
Not applicable	2	5			2	3
TOTAL	40	100	23	100	63	100

Average years in farming - 16.35.

The average area cultivated was 5.50 hectares and the average harvest was 54.94 cavans per hectare (Tables 7 and 8). A great majority, 68 percent, had 1-5 hectares, 21 percent had 6-10 hectares, 6 percent had 11-20 hectares, and one operated more than 21 hectares. Seventeen, or less than half of the respondents, had 41-50 cavans per hectare as their usual harvest and only two usually harvested 90-100 cavans per hectare.

Table 7. Area being cultivated.

Area cultivated	Table-thresher respondents		Row-seeder respondents		Total	
	No.	Percent	No.	Percent	No.	Percent
1-5 hectares	28	70	15	65	43	68
6-10 "	7	17.5	6	26	13	21
11-20 "	3	7.5	1	4.5	4	6
21 or more			1	4.5	1	2
Not applicable	2	5			2	3
TOTAL	40	100	23	100	63	100

Average area cultivated - 5.50 hectares.

Table 8. Usual harvest per hectare.

Yield (cavans/hectare)	Number		Total
	Dry	Wet	
30-40	5	1	6
41-50	12	5	17
51-60	2		2
61-70	5	2	7
71-80	3	1	4
90-100	2		2
Not applicable	2		2
TOTAL	31	9	40

Average - 54.94 cavans/hectare.

Table 9 shows that seven respondents, or 11 percent, were tenants; 28 percent were lessees; 13 percent were owner-lessees; and many of them, 32 percent, were owners. Thirty had no helpers on the farm, 14 had two to three household members who could help, and only one had four farm helpers (Table 10).

Table 9. Tenure status.

Tenure status	Table-thresher respondents		Row-seeder respondents		Total	
	No.	Percent	No.	Percent	No.	Percent
Tenant	4	10	3	13	7	11
Lessee	11	27.5	7	30.5	18	28
Owner	10	25	10	43.5	20	32
Owner-lessee	6	15	2	9	8	13
Rent to own	7	17.5	1	4	8	13
Not applicable	2	5			2	3
TOTAL	40	100	23	100	63	100

Table 10. Household members who can help on the farm.

Number of household members	Table-thresher respondents		Row-seeder respondents		Total	
	No.	Percent	No.	Percent	No.	Percent
None	16	40	14	61	30	48
1	10	25	6	26	16	25
2	6	15	1	4	7	11
3	5	12.5	2	9	7	11
4	1	2.5	-	-	1	2
Not applicable	2	5	-	-	2	3
TOTAL	40	100	23	100	63	100

Sixteen out of 63, or 25 percent of the respondents, were not members of cooperatives. Of the 15 non-members, six were owners, also six were tenants, and four were lessees. Thirty-eight out of 63, or 60 percent of the respondents, were mostly members of the FACOMA. Respondents from Llanera (2) and Talavera (5) were members of a barrio-based, multipurpose farmers' cooperative -- a Moshov type being conducted by an Israeli technician with a Filipino counterpart, and a compact farming cooperative.

The longest period of membership in cooperatives was 24 years and the shortest was one year. Most had been members of cooperatives from 1 to 5 years; the average period of membership was 5.63 years. The 38 who sought membership in the FACOMAs did so for two major reasons: they could borrow money for farming purposes, and the interest on loans was at a minimum level.

Table 11. Period of membership in cooperatives.

Period of membership	Table-thresher respondents		Row-seeder respondents		Total	
	No.	Percent	No.	Percent	No.	Percent
1-5 years	22	71	8	50	30	64
6-10 "	5	16	2	12.5	7	15
11-15 "	1	3	2	12.5	3	6
16 and above	3	10	4	25	7	15
TOTAL	31	100	16	100	47	100

Average - 5.63 years.

Table 12. Reasons for joining cooperatives.

Reason	Times mentioned		
	Table-thresher respondents	Row-seeder respondents	Total
1. Can borrow money for farming purposes	19	11	30
2. Easy to borrow money	6	4	10
3. Charges minimum interest	5	1	6
4. Easy paying terms	1		1
5. Wants to take advantage of government's help	1		1
6. Is employed by the cooperative	1		1
7. Can gain information about farming	1		1
8. To have cooperation among all farmers	1		1
9. Everybody else is and it was attractive before	2		2
TOTAL	37	16	53

On the other hand, 15 did not join the cooperatives for the reasons that they were not full-time farmers (3), afraid they could not pay (3), felt no need to borrow and disliked terms of payment (1), and the FACOMA was poorly managed (3). Two, however, did not give any reason for not joining any cooperatives.

Table 13. Reasons for not joining farmers' organization.

Reason	Times mentioned		
	Table-thresher respondents	Row-seeder respondents	Total
1. Not a full-time farmer	3		3
2. Afraid to borrow, might not be able to pay	1	2	3
3. No need to borrow; has heard that it takes long before one can borrow and that one can pay only in terms of palay, not in cash	1		1
4. FACOMA is poorly managed	1	2	3
5. Still waiting for application approval		1	1
6. Was not able to pay loan	1	1	2
7. No response	2		2
TOTAL	9	6	15

Present Threshing Practice

All of the respondents used the tilyadora for threshing in both dry and wet seasons, except for two who practiced the "hampas" system during the rainy season because the tilyadora could not reach their fields. Generally, they threshed their palay from less than a week's time to three months after harvesting (Table 14). The intervening period between harvesting and threshing depended on the time when the tilyadora could reach and service them.

In most cases the crop was handled four times from harvesting to final stacking: handling during harvesting, tying into bundles, preparing of small piles, and making of final stacks whether small ("sipok") or big ("mandala").

Forty-three percent of those who used "hampas" and 78 percent of those who used the tilyadora said it was necessary to dry the palay before threshing, while 43 percent and 16 percent, respectively, averred it was not necessary. One stated sometimes it was necessary and another one had no opinion.

Although many of them opined that drying prior to threshing was not necessary , the general practice was to dry the palay before threshing either by hampas or tilyadora. This was so because they had to wait for the tilyadora anyway and while waiting their palay became dry. They also found it more economical to dry the palay before threshing than afterwards. Some did not have the space to dry threshed palay.

Specifically, they liked the palay dry before threshing by hampas because by then the grain peduncles had weakened, thus making threshing easier. Drying the palay before threshing in the tilyadora gave the following advantages: the palay could be stored immediately after threshing; less grains remained with the straw, hence less wastage; threshing was faster; the palay did not germinate while in storage; and discoloration and grain damage were avoided, resulting in higher market value of their palay (Table 16).

While the general practice was to dry palay before threshing, some did not find it necessary to do so (Table 17). Tilyadora could thresh fresh palay, palay might be stolen if left in the field to dry, the tilyadora could reach the farm even when wet, and the palay could be dried after it had been threshed, were the reasons for the few exceptions.

Only two of the respondents themselves threshed by hampas without hiring any laborers. Even the others who threshed by hampas for food and seed purposes did not hire anyone. The lowest rate for harvesting and threshing (hampas) combined was 1:4 and the highest was 1:7. In majority of the places visited a sharing of 1:6 was practiced. If money was given instead of the share, the rates were P3.00 a day excluding meals, and P2.50 a day including meals.

Table 14. Time interval between harvesting and threshing.

Time interval	Number
Less than one week	4
One week	3
Two weeks	12
Less than one month	7
One month	8
More than one month	2
Two months	3
Three months	1
TOTAL	40

Table 15. Number of times palay was handled from harvesting to final stacking.

Number of times	Number
Thrice	11
Four times	22
Five times	7
Total	40

Table 16. Reasons for drying palay before threshing.

Reason	Times mentioned
1. It is hard to thresh in tilyadora if palay is undried	11
2. Undried palay germinates if stacked	2
3. To lessen wastage of grains left with straw	9
4. To avoid grain discoloration and damage	5
5. So that it can immediately be stored	8
6. Undried palay commands low price	2
7. No space for drying threshed palay	1
TOTAL	38

Table 17. Reasons for not drying before threshing in tilyadora.

Reason	Times mentioned
1. Tilyadora can thresh wet palay	2
2. Palay might be stolen if left in field to dry	1
3. Can dry after threshing	1
4. Tilyadora can come even when field is wet	1
TOTAL	5

The highest rate charged by the tilyadoras was six percent and the lowest, four percent. However, majority of the respondents paid five percent to tilyadoras for threshing fees (Table 18). The usual threshing capacity of tilyadoras in the towns visited was 70-80 cavans per hour. On the other hand, it would take 10-20 people to thresh harvested palay from one hectare in one day. The number of people who could thresh a hectare's harvest in one day depended on their comparative skill and speed.

Only three, or 8 percent, said tilyadoras could go to their fields even if wet. Obviously, those were the farmers whose fields were near the roads. Needless to say, the tilyadoras could always go to their fields during the dry season.

Table 18. Rate of payment for tilyadora.

Rate	Number
Four percent	3
Four and one-half percent	2
Five percent	32
Six percent	3
TOTAL	40

Of the 92 percent whose fields could not be serviced by the tilyadora during the wet season, 53 percent hired people to haul their harvest to the site of the tilyadora. Most of them usually hired 15-20 people to haul a hectare's harvest in one day at P3.00 each or five people with bullcarts at P5.00 each.

The respondents claimed it was not necessary to have big haystacks or mandala, but 80 percent found it advantageous. The advantages mentioned were: it lessened movement of tilyadora, thus hastening threshing; it lessened spillage; it minimized efforts expended by people with the tilyadora; and less palay was exposed to rain in big haystacks.

Thirty percent of the respondents claimed big haystack preparation as an additional expense because seven hired people to make big haystacks, and five said the helpers asked for palay or were given free lunch and snacks, which cost as much as P20-P30. The remaining 70 percent did not consider as additional expense the free lunch and snacks given to people who worked bayanihan or suyuan style in mandala preparation.

A hypothetical question, "If you will be hired to thresh, which method would you prefer to use?," was asked. Thirty preferred to use the table thresher, six the hampas system, and four the tilyadora. Reasons for their preferences revolved on the extent to which the threshing method could make their job easier and the reward they could get in terms of earnings. The specific reasons for their preferences are found in Table 21.

Table 19. Advantages of big haystacks.

Advantage	Times mentioned
1. Lessen movement of tilyadora and hasten threshing	10
2. Lessen spillage	12
3. Less palay exposed to rain in big haystacks	1
4. Minimize efforts expended by people with tilyadora	8
5. Can easily call for tilyadora's service	1
Total responses	32

Table 20. Why preparation of big haystacks is an additional expense.

Reason	Number
1. Have to spend for meal and snacks even if it is bayanihan	3
2. Have to hire people to prepare haystacks	7
3. People who helped ask for palay	2
TOTAL	12

Table 21. Reasons for preferring method of threshing if one were hired to thresh.

Reason for choice		Times mentioned
A. Table thresher		
1. Less effort expended and less tedious		22
2. Faster than hampas		2
3. Less spillage		2
4. Can work under the shade		3
5. Economical		1
	Total	30
B. Hampas system		
1. No need to winnow		2
2. Easier than to feed table thresher		1
3. Can earn more		3
	Total	6
C. Tilyadora		
1. Greater capacity		2
2. Larger income		2
3. Can rest once in a while		1
4. Free meals		1
	Total	6
Total responses		48

Characteristics of the Table Thresher

Portability of the table thresher

Table 22 shows that only 15 of the respondents used the table thresher in the field. Ten of them had wet fields, and five, dry fields. The rest of the respondents (25) used the table threshers either near the house, road, or in the FACOMA compound, in which case there was not much movement of the table thresher and no transportation problems were encountered.

The table thresher was transported with the use of either a sled, a bullcart, a six-by-six truck, or a tractor trailer. Five threshers were carried by the farmers themselves (Table 23).

The respondents unanimously observed that on roads and dry fields the wheels could facilitate its transportation because it could be pushed or pulled, but two wheels were insufficient to make it stable. Moreover, on wet, soft, muddy soil, the size of the present wheels would not be of any help. If it had to be carried, six or more people could hardly bear it through narrow, slippery paddies. Mounting the table thresher on a sled or bullcart so that it could be pulled by a carabao might help in such a situation.

The problems met in transporting the table threshers were its heavy weight, instability, and the lack of sufficient area to hold on.

Table 22. Place where table threshers were used.

Place	Number
1. Near the house	17
2. In the field	15
3. In FACOMA compound	5
4. Near the road	3
TOTAL	40

Table 23. How the table thresher was transported.

Way transported	Number
1. On a sled or bullcart	6
2. On a six-by-six truck or tractor trailer	4
3. Carried on back by people	5
TOTAL	15

Efficiency and operational cost of the table thresher

Among the interviewees, 29 threshed their palay with the table thresher. Three, or 10 percent, threshed traditional varieties; 26, or 90 percent, new recommended varieties. Raminad, Macapagal, and Inesco composed the traditional ones, while IR-20 and IR-22 constituted the new recommended varieties.

The farmer who threshed Inesco, a traditional variety which is harder to thresh than Peta, found out that the straws got broken and were left inside the table thresher with the grains still on them. He had to remove the broken straws and thresh them by feet.

Of the 29 farmers who used the table threshers, 59 percent said their harvests were poor and only 41 percent reported their harvests as average. Seventeen of them got a much lower harvest than their estimates prior to threshing. Poor harvest was due to tungro infestation.

The maximum number of people involved in the use of the table thresher was eight. More than half of the users employed from one to four helpers who assisted the feeders by handing in the bundle of palay to be threshed (Table 24).

Based on six attributes (capacity, effort expended, cleanliness, grain damage, spillage, and condition of palay during threshing), the respondents were asked to rank the three methods of threshing -- hampas system, tilyadora, and table thresher. Table 25 shows that in the overall ranking tilyadora came first, followed by the table thresher, then by hampas system.

Table 24. Number of people who fed table thresher.

Number of feed helpers	Number	Percent
1. Complete feeders* without helper	16	40
2. Complete feeders with four helpers	12	30
3. Complete feeders with three helpers	3	75
4. Complete feeders with two helpers	6	15
5. Complete feeders with one helper	1	25
6. Incomplete feeders	2	5
TOTAL	40	100

*Complete feeders refers to four people feeding the thresher.

Table 25. Standing of table thresher as compared with tilyadora and hampas system.

Category	Rank		
	I	II	III
1. Capacity	Tilyadora	Table thresher	Hampas system
2. Least effort expended	Tilyadora	Table thresher	Hampas system
3. Cleanliness of grains threshed	Tilyadora and hampas system	Table thresher	
4. Least grain damage	Hampas system	Table thresher and hampas system	Tilyadora
5. Least spillage	Table thresher	Hampas system	Tilyadora
6. Can thresh wet palay	Table thresher	Hampas system	Tilyadora
Overall	Tilyadora	Table thresher	Hampas system

The advantages and disadvantages of the table threshers over the hampas system and the tilyadora are listed in Tables 26 and 27. An advantage of the table thresher over the hampas system not ever mentioned earlier was that stealing of palay during threshing was avoided.

Table 26. Table thresher compared with the hampas system.

Comparison	Times mentioned
A. Advantages of table thresher over hampas	
1. Less effort needed	17
2. Can use it even if alone or even without hired help	1
3. Faster than hampas	7
4. Lesser spillage	3
5. Cheaper pay	5
6. Advisable for seed purposes	2
7. Palay threshed is clean	2
8. Can avoid stealing of palay during threshing	1
9. Hay orderly collected	1
Total	38
B. Disadvantages of table thresher	
1. Not practical for big-scale farming	2
2. Still need to winnow	3
3. Need to hire harvesters and assistants	2
4. Difficult to transport	1
Total	8
Total responses	46

Interviewees from Cabanatuan City reported that the hampas threshers had companions who cleaned up the hay after threshing. The threshers threw away the hay even if there were grains still to be threshed. Sometimes as much as 50 percent of the grains were intentionally left on the hay so that their companions could get more. This happened usually when the farmer was not around during threshing time. Employing the table thresher could utilize family labor and avoid such an anomaly.

Table 27. Table thresher compared with tilyadora.

Comparison	Times mentioned
A. Advantages of table thresher over tilyadora	
1. Less spillage	2
2. Can be brought to field	8
3. Threshes wet palay better	5
4. Can make use of family labor	1
5. Good for seed purposes	3
6. Can rethresh to make palay clean	3
7. Cheaper pay	1
Total	27
B. Disadvantages of table thresher	
1. Lower capacity	14
2. More tedious than tilyadora	6
3. Palay threshed not clean	4
4. No weighing scale	1
Total	25
Total responses	52

Concerning the capacity and quality of palay threshed, the respondents were asked which they would prefer among the three threshing methods. Twenty-eight percent preferred the table thresher; 35 percent the tilyadora; 35 percent said it depends on the season, the volume of palay to be threshed, and the purpose for which the palay is intended; and one did not give any response. Reasons given for their choices were the same as the advantages of each method (Table 18).

One of the mentioned disadvantages of the table thresher compared with the hampas system and the tilyadora, was the uncleanliness of the threshed palay. Thirty-three percent of the respondents mistook the air inlet for a blower. They unanimously suggested increasing the capacity of the air passage and/or installing a blower to make the threshed palay clean.

Table 28. Reasons for threshing method preference based on amount and quality threshed.

Reason	Times mentioned
A. Table thresher	
1. Practical for own use	3
2. Can be brought anywhere	5
3. Suitable for seed purposes	2
4. Has little spillage	2
5. Threshed palay is clean	1
Total	13
B. Tilyadora	
1. Fastest and least effort needed	13
2. Has least spillage	1
3. Palay threshed is clean	3
Total	17
C. Others	
1. It depends on the season. During dry season, tilyadoras are available. During wet season, tilyadoras cannot get in so table threshers can be used.	6
2. It depends on volume to be threshed and purpose for which palay is intended. Table thresher is suitable for seed purposes and for emergency food consumption, but tilyadora is more practical to use for big volume of harvest.	8
Total responses	44

Capacity-wise, the table thresher ranked second to the tilyadora, but a farmer mentioned an exceptional person who could thresh faster than the table thresher.

To probe deeper into their preferences, the respondents' opinions regarding the most economical method of threshing to use were also gathered and tabulated. Table 29 presents the breakdown of their choices. Reasons for their choices were also asked and listed in Table 29a.

Table 29. Opinion on the most economical threshing method.

Threshing method	Number	Percent
1. Table thresher	19	47.5
2. Hampas system	3	7.5
3. Tilyadora	8	20
4. Table thresher and tilyadora	5	12.5
5. It depends on the season	4	10
6. Don't know	1	2.5
TOTAL	40	100

Nineteen, or 47.5 percent, chose the table thresher because in their opinion it was the least expensive to use. What was meant was that they utilize family labor instead of hiring others; it had lower rental than the hampas and the tilyadora; and there was no need to pay for hauling, for palay was threshed right in their own fields where the hay remained to serve as fertilizer.

Aside from the above advantages, the table thresher had the least spillage; it needed lesser effort than the hampas system; it could be brought to the fields; and it could thresh wet palay.

The reasons for choosing the tilyadora (20 percent) were: it threshed very much faster than any of the other two; there was not much work on the part of the farmer, because feeding, winnowing, sacking, and sometimes even weighing were all taken care of; the pay was only five percent; they could enjoy certain privileges; and only six people were needed.

Two still preferred the hampas system because they asserted there was no need to spend for hauling nor for gasoline. Three declared the tilyadora and the table thresher were equally economical for one had an advantage over the other. For instance, they said that the table thresher was practical for "small-scale farming" and the tilyadora, for "big-scale farming." The table thresher could be brought to the field during rainy season and could thresh wet palay while the tilyadora could not.

Table 29a. Reasons for considering method of threshing as most economical.

Reason	Times mentioned
A. Tilyadora	
1. Pay is only five percent	3
2. Only six pelple are employed	1
3. Not much work on the part of the farmer	4
4. Threshes very much faster	3
5. User enjoys certain privileges	2
Total	13
B. Table thresher	
1. Least spillage	4
2. Lesser effort than hampas	4
3. Least expensive	14
4. Hay remains in field to serve as fertilizer	1
5. Can be brought in fields	1
6. Can thresh wet palay	1
7. Good substitute when tilyadora can't come in	1
Total	26
C. Hampas	
1. Will not pay for hauling	1
2. No gasoline expense	1
Total	2
D. Others	
1. Tilyadora and table thresher the same	5
Total responses	46

Other Possible Factors that Might Affect Acceptance of the Table Thresher

Seventy-five percent of the respondents foresaw other uses of the table thresher's motor while not being used for threshing, if a dynamo would be added to it. Other possible uses mentioned were: water pump, electric generator, powered sprayer, and powered saw (Table 30).

The farmers interviewed were not obliged to rent the tilyadora of their landlords, except for one who landlored allowed him to rent others' tilyadoras if they belonged to his (landlord's) relatives.

Table 30. Possible uses of table thresher's motor.

Other possible uses	Times mentioned
1. Water pump	24
2. Electric generator	14
3. Powered sprayer	4
4. Powered saw	1
5. Blower	1
6. Don't know	1
Total responses	45

Among the privileges that accrue with the use of the tilyadora, free use of sacks and thread was the most frequently mentioned; 0.5 percent of the harvest going to the barrio, second; discount in hauling, third; and weighing of palay, last (Table 31).

Twenty-three percent opined that adoption of the thresher would result in labor displacement in their locality. They said that because of the tendency to utilize family labor, the people doing the hampas and those working with tilyadoras would lose their jobs.

Table 31. Privileges enjoyed when renting tilyadora.

Privileges	Times mentioned
1. Free use of sacks and thread	39
2. Barrio gets 0.5 percent of palay threshed	11
3. Discount in hauling fee	9
4. Palay is weighed	1
Total responses	60

On the other hand, 77 percent stated there would be no labor displacement; instead, it would increase the demand for labor. Labor was so scarce that they would still need to hire harvesters, feeders, and grain cleaners. Harvesting and threshing would be hastened and labor demand created for other farm operations, such as land preparation, planting, and weeding (Table 32).

When asked who among the respondents would like to have a table thresher, 80 percent answered in the affirmative, 18 percent negative, and one said maybe. Those who wanted to have a thresher said they could use it anytime in any weather so they would not have to wait for the tilyadora; less effort was needed and it was less tedious; it was economical for the owner-operator; and it was practical for raising a second crop when the area cultivated was small (Table 33).

Reasons given for not wanting a table thresher were: tilyadoras were available and could service them anytime; the table thresher was heavy and the palay threshed from it was dirty; and they could not afford the table thresher because it was expensive (Table 33).

Table 32. Reasons for the possibility of labor displacement or non-displacement.

Reason	Times mentioned
A. Displacement	
1. People doing hampas will lose their job	6
2. Some people working with tilyadora will lose their job	2
3. No need to hire labor, will just utilize family labor	1
Total	9
B. Non-displacement	
1. Will still need to hire laborers to harvest, feed, and clean the palay	27
2. Labor is scarce	3
3. Will hasten harvesting and threshing and create labor demand for other farm operations, such as land preparation, planting, and weeding	2
Total	32
Total responses	41

Table 33. Reasons for liking or disliking to have a table thresher.

Reason	Times mentioned
A. Disliking	
1. Tilyadoras are available and can service us anytime	3
2. It is heavy and the palay threshed from it is dirty	2
3. Cannot afford, it is expensive	3
Total	7
B. Liking	
1. Economical for owner-operator	10
2. Easier to use than hampas	5
3. Can use it anytime in any weather	14
4. Practical for second crop when area planted is small	3
5. Tilyadora cannot reach my place	1
6. Can rent it out	1
7. Can use engine for other purposes	1
Total	35
Total responses	42

Policy Implications

It was either through the FACOMA, the NELRIDP, the CLSU project, the landlord, a demonstration, a technician, or during the table thresher's delivery that the farmers first learned about the table threshers (Table 34).

Fourteen out of 30 respondents tried the table thresher because they wanted to see if it was really advantageous; seven, because the harvest time was on a wet season and the tilyadoras could not come in; two wanted to set an example; another two, because the table thresher was something new and they had nothing to lose; one found Inesco was hard to thresh by hampas; one needed palay badly for food; and three wanted to save money (Table 35).

Table 34. How they first learned about the table thresher.

How they first learned about the table thresher	Number	Percent
1. Through NELRIDP	9	22.5
2. From a demonstration	5	12.5
3. Through the FACOMA	16	40
4. Saw it when it was delivered	1	2.5
5. Through CLSU project	3	7.5
6. Through the landowner	1	2.5
7. Through the technician	5	12.5
TOTAL	40	100

Table 35. Reasons for trying table thresher.

Reason	Number	Percent
1. Wanted to see if it's really advantageous	14	47
2. Wanted to set an example	2	7
3. It was something new and there was nothing to lose	2	7
4. Hard to thresh 'Inesco' by hampas	1	3
5. Harvesting was on a wet season and the tilyadora could not come in	7	23
6. I needed palay for food	1	3
7. Wanted to save money	3	10
TOTAL	30	100

At the start of the project, the NELRIDP set a policy that the FACOMAs were to rent out the table threshers at no more than four percent of the palay threshed. One percent should go to the FACOMA to be used as down payment in case it decides to purchase a table thresher, one percent to the operator to cover gasoline and oil expenses, and two percent for the feeders.

In dry season '72, at the start of the project, 15 table threshers were delivered to nine FACOMAs but only 10 were used. Only four FACOMAs

were able to rent out six table threshers to eight farmers. The rest (4) were used for trial or demonstration purposes. All table threshers (12) used during the wet season were for demonstration purposes.

Of the four FACOMAs which earned from the table threshers' rental, three FACOMAs had the right interpretation of the policy, whereas one did not. Among the eight farmers who rented the table threshers, six were not informed about the use of the rental and the rest (2) were properly informed by the president of the FACOMA.

The respondents were asked, "If you were to be hired as operator, would you be amenable to one percent fee?" Twenty-nine said yes, 10 said no, and one had no opinion. The reasons for saying yes or no are tabulated in Table 36.

"If you were a farmer who wants to rent a table thresher, would you be willing to pay four percent?" To this question, 31 said yes, eight no, and one did not respond. The reasons for saying yes were: it was fair enough (26), and he could economize by operating and feeding at the same time (5).

Table 36. Reasons for willingness or unwillingness to pay one percent share for operating table thresher.

Reason		Number
A. Why willing		
1. All he has to do is to start the machine		19
2. Operator can earn extra by feeding the machine		4
3. For the sake of the cooperative		6
	Total	29
B. Why unwilling		
1. Prefer to be hired by cooperative on monthly basis because I can earn more		6
2. Want it for own use		2
3. Customers will mostly be relatives and neighbors		2
	Total	10
TOTAL		39

COMMENTS AND SUGGESTIONS

During the first two weeks' interview comments and suggestions of the respondents regarding the table threshers were also recorded and hereby enumerated.

Comments

1. The feeders got covered with palay dust which caused extreme itchiness.

2. The alignment of the thresning table assembly and the screen assembly was uneven.

3. The machine slipped maybe because of the motor's low power.

4. Threshing was risky if the straws were short because of the great probability of the feeders' hands getting hurt.

Suggestions

1. Change the wheels to bigger ones and add one or two to make the thresher stable so that it could easily be brought to muddy places.

2. Facilitate the transportation of the thresher in muddy places with the use of a sled or a bullcart.

3. Add a blower or increase the air capacity in the air assembly to avoid further winnowing and save effort, time, and gasoline.

4. Construct a platform where the palay to be threshed could be placed to minimize movements of the feeders in getting the palay to be threshed.

5. Build a shed in the field to house the table thresher and the threshed and unthreshed palay, thus protecting them from sudden rainfall and robbers.

6. Construct a mini-model of the tilyadora which needs only one outlet and one feeder to throw the bundle of palay to be threshed into the thresher instead of holding it. The model desired should be light enough to be used in the field and should have a greater capacity than the present table thresher.

None among the users in the wet season complained about the uneven alignment of the table and screen assemblies, and the insufficient air capacity of the air assembly, because prior to the start of this harvest season the necessary repair and adjustments had already been done.

PLANTING PRACTICE AND THE USE OF THE ROW SEEDER

In any method of planting, land preparation is the first step. Table 37 shows that expenses for land preparation varied depending on whether bullock, hand tractor, or big tractor was used. Using the bullock was more expensive than big tractors, and the more mechanized the land preparation the less time it took to prepare a hectare.

Table 37. Method of land preparation, average cost and time consumed per hectare.

Method of land preparation	Number using	Average cost/ha.	Average time consumed/ha. (hrs.)
Big tractor	6	₱ 116.16	7
Hand tractor	4	130.00	14.25
Bullock	11	136.66	12.54
Hand tractor and/ or bullock	2		

All respondents (23) used the transplanting method, particularly the "dasi-scrambled" method. The least that a respondent spent for planting a hectare was ₱36.00 and the most was ₱100.00, although, majority of them, 70 per cent, spent from ₱50.00 to ₱60.00 (Table 38). It usually took 10 to 15 people to plant a hectare (Table 39), and the average time spent was 1.04 days per hectare.

Table 38. Planting cost per hectare.

Planting cost	Number	Percent
1. ₱45.00/ha. & below	3	13
2. 50.00/ha.	7	31
3. 56.00/ha	1	4
4. 60.00/ha.	8	35
5. 70.00/ha.	1	4
6. 80.00/ha.	2	9
7. 100.00/ha.	1	4
Total	23	100

Table 39. Usual number of people needed to plant a hectare.

Number of people	Number	Percent
1. 10 people/ha.	7	30.5
2. 12 people/ha.	2	9
3. 14 people/ha.	1	4
4. 15 people/ha.	7	30.5
5. 16 people/ha.	1	4
6. 20 and above people/ha.	5	22
Total	23	100

Other expenses incurred in the dasi-scrambled method were for the pulling and hauling of seedlings, which were estimated to be around ₱80.00 and ₱20.00 per hectare, respectively.

Use of the Row Seeder

Land preparation

The respondents unanimously admitted differences between the land preparation of the direct-seeded field, with the use of the row seeder, and their present practice. The two mostly mentioned differences were that the field in the former was levelled (17) and it was thoroughly prepared (14) (Table 40). What was meant by thoroughly prepared was that the weeds were killed. All, except one who hurriedly prepared his field, said their direct-seeded fields were carefully prepared on the basis of the practices (levelling the field and killing the weeds) they used.

Table 40. Differences in land preparation between direct-seeding and transplanting method.

Difference	Number of times mentioned
1. Land more thoroughly prepared	14
2. Field more levelled	17
3. Like seedbed preparation	2
4. Fertilizer can be applied at planting time	2
5. Land can be immediately prepared after harvest	1
Total	36

All of the respondents, except two, did not bother to record the amount they spent for preparing their direct-seeded fields, since the areas were only small and the amount involved was negligible. One estimated his expenditure at ₱30.00 per 300 square meters, while one who direct-seeded his eight hectares spent ₱100.00 per hectare for land preparation alone. A respondent estimated the levelling expense at ₱10.00/hectare.

Availability of irrigation water

All 23 respondents had irrigation water during the wet season, but three did not have any during the dry season. The three common sources of water were the National Irrigation Agency (NIA), water pump, and both NIA and water pump. One farmer could plant only one crop a year, since his irrigation water was good only for five months; four could plant twice a year; and two would need a supplementary source of water to be able to plant two crops each year.

Sixteen claimed they had adequate water to irrigate their entire farms; two said their water was enough because they could plant continuously and the harvest was good; and one was even able to irrigate neighboring

farms (Table 41). On the other hand, four did not have enough water to irrigate their entire farms because they were far from the irrigation canal, late crops became dry, and the source of water pump dried up during the dry season. One out of the 23 could not get water at the time of need because his farm was far from the water source. However, nobody had the problem of controlling the irrigation flow.

Table 41. Reasons for sufficiency of irrigation water.

Reason	Number
1. Can irrigate entire farm	16
2. Harvest is good	1
3. Can irrigate other farms	1
4. Can plant continuously	1
Total	19

Weed control

Ten respondents employed chemical (Machete and Gramoxon) weed control; four, the mechanical method, that is, with the use of the hand and/or the rotary weeder; two, a combination of mechanical and chemical; and seven did not practice any weed control (Table 42).

A farmer who direct-weeded his eight hectares spent ₱300.00 for weed control. The rest did not spend any, since in many cases, the necessary ingredients (seeds, weedicides, insecticides, and fertilizers) were provided for, for demonstration purposes. If ever a number of the respondents spent for this purpose the sum would have been negligible. Many (12) controlled weeds once, two twice, and two thrice.

In direct seeding the right time of applying irrigation water is very vital not only for the growth of the plants but also for controlling the weeds. Nineteen of the respondents were able to irrigate on the prescribed time or when they thought it was necessary. Four failed to irrigate on the prescribed time because of inadequacy or absence of water, sandy soil which easily dried up, and excessive water due to rains at the time of seeding.

In spite of the proper time of irrigation and weed control, which most of them did not usually practice, 12 reported their weed problem was the same as before and two complained they had more problem with weeds in their direct-seeded fields.

When asked about the stand of their plants, 15 said good and eight, fair; nobody said poor. Twenty-one respondents claimed their direct-seeding trial was a success for reasons stated in Table 43. However, two said the trial was a failure because they were not able to weed, or the seeds or plants were eaten by rats and birds.

Table 42. Weed control used.

Weed control	Number	Percent
1. Chemical	10	44
2. Mechanical	4	17
3. Both chemical and mechanical	2	9
4. None	7	30
Total	23	100

Table 43. Reasons why row-seeder trial was considered a success.

Reason	Number	Percent
1. Good stand of plants	9	43
2. Good tillering	5	24
3. Can finish planting faster	3	13
4. Can be managed well	2	10
5. Can harvest earlier	1	5
6. No weeds	1	5
Total	21	100

Other Possible Factors That Might Affect The Acceptance of the Row Seeder

The advantages of direct seeding outweighed its disadvantages (Tables 44 and 45). The advantages mentioned were: 1) it saves money, time and effort; 2) the growth of the plants is not disturbed; 3) one person can do the planting; 4) rotary weeder can be used in weeding; and 5) the plants have good stand.

Most of the disadvantages mentioned referred to the additional expenses for thorough land preparation and effective weed control. Others were: its inapplicability during the wet season; exposure of seeds to chickens, birds and rats; more seeds have to be used; and non-uniformity of seed distribution. The problems met in the use of the row seeder were practically the same as the disadvantages mentioned (Table 46).

Table 44. Advantages of direct seeding over present planting practice.

Advantage	Times mentioned
1. Saves money, time and effort	19
2. Fast and no disturbance in growth of plants	6
3. One person can do the planting	3
4. Rotary weeder can be used in weeding	2
5. Good stand of plants	1
Total	30

Table 45. Disadvantages of direct seeding.

Disadvantage	Number reporting
1. Effective weed control is necessary	9
2. Not applicable during rainy season	4
3. Seeds are exposed to chickens, birds and rats	2
4. Thorough land preparation is necessary	2
5. Not uniform seed distribution	1
6. More seeds are needed	1
Total	19

Table 46. Problems met in the use of row seeder.

Problem	Number
1. Brass calibration - not uniform seed distribution	4
2. Capital is needed to buy weedicide and fertilizer	2
3. Needs thorough land preparation	2
4. Rows not straight if the one pulling is inexperienced	2
5. Not applicable during rainy season	1
6. Short handle of seeder	1
7. Needs two people to lift it	1
Total	13

Eighteen farmers would like to use the row seeder again and 16 wanted to own a unit. Nine would like to use it again because of its advantages; eight would like to try it on a larger area; and one was already late for planting and he did not have yet the seedlings for transplanting (Table 47). Three farmers wanted to own a unit so that they could use it anytime; one did not want to borrow from others; and another wanted to set an example so as to convince others to use direct seeding (Table 48).

Table 47. Reasons why they would like to use row seeder again.

Reason	Number reporting
1. Could see its advantages	9
2. Would like to try it on a larger area	8
3. Already late for planting	1
Total	18

Table 48. Reasons why they would like to own a row seeder.

Reason	Number reporting
1. Because of its advantages	11
2. Could use it anytime needed	3
3. So as not to borrow	1
4. To convince others	1
Total	16

More than half, 13, of the row-seeder users discounted the possibility of any labor displacement, because they had hired labor shortage or bayanihan was practiced (Table 49). Three opined that adoption of the seeder would only be on a small scale, and the hired planters could be utilized for weeding instead (Table 50).

Table 49. Source of labor.

Source of labor	Land preparation		Planting	
	No.	Percent	No.	Percent
1. Family	6	26	1	4.5
2. Hired	13	57	21	91
3. Combination of 1 and 2	2	8.5	-	-
4. Exchange labor (bayanihan)	2	8.5	1	4.5
Total	23	100	23	100

Table 50. Why they think there would be no labor displacement.

Reason	Number reporting
1. No hired labor would be affected	4
2. They could weed instead	4
3. Adoption will be on small areas	2
4. Shortage of planters	2
5. Not applicable to water-logged areas	1
Total	13

The person in-charge of the seeders and of conducting the demonstrations was mentioned by 16 farmers as their first source of information regarding the seeders. Three first heard about the seeders from the FACOMA, two from a co-farmer, one from a landlord, and another from a barrio captain (Table 51).

All of the users of the seeders had an audience when they direct-seeded their fields. The comments of the audience were either favorable or unfavorable. Among the favorable ones were: less planting expenses, can finish planting earlier, and it is good for upland areas. Unfavorable comments were: lewelling of field entails additional time and expense; it is good if there would be effective weed control; it is practical only for small areas; and it is not applicable during wet season. An observer wanted to see the yield first before giving any comment.

Table 51. Source of information about row seeder.

Source of information	Number	Percent
1. Engineer Roxas	16	70
2. Officer of the FACOMA	3	13
3. Co-farmer	2	9
4. Landlord	1	4
5. Barrio captain	1	4
Total	23	100

SUMMARY AND CONCLUSION

The common method of threshing in the land reform area of Nueva Ecija as found in this study was with the use of the tilyadoras. Farmers there seldom threshed by hampas or feet. The only time they did this was when they needed palay for food and seeds for planting material.

The data show that the table thresher could withstand competition with the hampas but not with the tilyadora in terms of quality and quantity threshed, effort expended, and rentals.

The farmers' responses indicated their preference for the tilyadora to thresh their main crop or the bulk of their harvest for various reasons. To a great majority of the respondents the table thresher and the tilyadora were incomparable because each one was more practical to use under two different conditions. They claimed that the table thresher was practical to use for small-scale farming, for food and seed purposes, and if and when the tilyadora could not service them.

The table thresher was only occasionally used because the tilyadoras were many and could service the farmers anytime they were ready. As of now, replacement of the tilyadora through the adoption of the table thresher does not look very promising in the study area.

Adoption of an improved table thresher is possible after the Pantabangan Dam will have been completed and the tilyadora cannot come in anymore, because the envisioned double cropping will require continuous irrigation and thus make the field wet all the time.

The dasi-scrambled method was the prevailing planting practice in the land reform area of Nueva Ecija as found in this study. None among the respondents used mechanized planting.

Since all of the direct-seeding trials (using the row seeder) were conducted under the supervision of Engineer Roxas and many got the demonstration kits, majority of the users were able to comply with the necessary cultural requirements (thoroughly and evenly prepared land, use of weedicides, proper water management and even application of insecticides and fertilizers). These could have been the reason why 91 per cent of the respondents claimed that their direct-seeding trial was successful.

Like the table thresher users, the row-seeder users also mentioned not only the advantages of the technology but also its disadvantages. The disadvantages mentioned were: 1) the additional expense for a levelled and thoroughly prepared land, and for weed control; 2) its non-applicability during rainy season; 3) its non-applicability for large-scale farming, that is, for more than three hectares; and 4) exposure of seeds to rats, birds and chickens.

It seemed that the respondents gave more weight on the advantages of the direct-seeding method because in spite of the disadvantages mentioned, 18 wanted to try it again on a larger area and 16 expressed their

desire to own a row seeder. Apparently, the stand of the plants after seeding was not the only vital factor for the favorable response to this technology. Five farmers had the "wait and see attitude" - they wanted to see the yield first before deciding on whether to permanently use it or not.

Labor displacement could not be a hindrance to its acceptance. The respondents unanimously answered that as long as a practice was to their advantage, they would use it in spite of objections from the labor force. In the first place, there was a shortage of hired labor; this was why the respondents used family or exchange labor, or both. At the peak of labor demand, during planting and harvesting, many respondents advanced payments to have priority in hiring labor. In view of the labor shortage and the extra labor needed in preparing the land for direct seeding, it is recommended that the row seeders and the hand tractors be introduced together.

The table threshers were introduced through the FACOMAS where no specific person was assigned to attend to its promotion, while the row-seeder demonstrations were personally supervised. Row-seeder defects were immediately remedied and questions regarding its use were promptly and satisfactorily answered. In the case of the table thresher, however, its use was delayed or prevented because of certain defects or lack of proper guidance in its operation.

Operation of the row seeder is much simpler than that of the table thresher. Once the desired calibration of the brass has been established, one person can easily manage to plant a hectare in a day or two, while the table thresher needs no less than four people to operate.

The table thresher and the row-seeder differed a lot in cost. At depreciated value, the table thresher costs ₱2,500, while the seeder costs only ₱300.00. Most of the respondents could most likely afford more the seeder than the table thresher.

The present data indicate that the future adoption of the row seeder in the land reform area of Nueva Ecija may be viewed with optimism, especially when the farmers appreciate the higher yield it could give. On the other hand, the grain cleaners could only be in demand where FACOMAS are active and in good business standing.

Before introducing an intermediate technology such as the use of the table thresher and the row seeder, the existing practices to be replaced, the avenues and method of its introduction, the sociological implications, and most of all, the economic advantages to be derived therefrom, should be carefully studied.