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A FARMER'S PRIMER
ON GROWING RICE
IN TWO PHILIPPINE
DIALECTS**

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ABSTRACT

The Tagalog and Hiligaynon editions of *A farmer's primer on growing rice*, which is published in 30 languages, were evaluated for their effectiveness in transferring rice technology information to 84 farmers in Cavite and Negros Occidental, two provinces in the Philippines. Relationships among farmers' sociodemographic characteristics, communication variables, and the Primer's effectiveness in terms of knowledge gain were also tested.

A 73-item test was used to measure initial knowledge level. The farmers were then given copies of the Primer in Tagalog (Cavite farmers) or Hiligaynon (Negros farmers). A post-test was given 45 d later to measure knowledge gain.

On both tests, farmers who answered less than 50% of the test questions correctly were defined as having "low" levels of knowledge, and those with 50% or more correct answers as having "high" knowledge. Only 4% of the farmers had high knowledge in the pretest, but 46% had high scores after reading the book. The *t*-test also showed that, although farmers who finished the book and those who did not were not significantly different in initial rice knowledge, the difference in post-test scores was highly significant. The farmers' knowledge gain concerning fertilizer was highest. In the pretest, only 15% knew the meaning of "24-12-12" on a fertilizer sack, but half knew after the treatment. Of 14 independent variables tested, only 4 were significantly related to knowledge gain: previous participation in rice training courses, land tenure, number of years in rice farming, and exposure to newspapers. The Cavite and Negros farmers generally matched well in most variables.

Farmers evaluated the Primer's design, packaging, and message content favorably but suggested improvements to increase its effectiveness, such as the deletion or substitution of abstractions and symbols that they found confusing or hard to understand.

IRRI is using the findings of this study to make forthcoming publications, designed on the Primer concept, more effective.

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THE EFFECTIVENESS AMONG FARMERS OF *A FARMER'S PRIMER ON GROWING RICE* IN TWO PHILIPPINE DIALECTS

Language differences inhibit the flow of agricultural information not only among scientists but even more so from research institutions to farmers, the ultimate users of technology. To alleviate the language barrier in technology transfer, the International Rice Research Institute (IRRI) has developed its *copublication* program — cooperative ventures with national agencies and private publishers in which the cooperator translates IRRI books and handles most distribution. IRRI designs certain publications to make them easy and inexpensive for cooperators to copublish.

By late 1986, at least 773,000 copies of 91 non-English editions of 23 IRRI books had been copublished in 36 languages. Another 45 editions of 12 books were in press. The most popular among these books is *A farmer's primer on growing rice*, authored by Dr. Benito S. Vergara, IRRI plant physiologist. The Primer is a highly illustrated book that describes the "hows" and "whys" of improved techniques for lowland rice farming. It has minimal text and uses black-and-white illustrations with ample white space on every page to allow for text translation. The author and IRRI (the publisher) hoped that this picture-text combination would help farmers better understand the book's messages.

The original English edition of the Primer was published in 1979 in the Philippines. IRRI blocked off the text and printed sets of the illustrations. Copublishers translate and typeset the text, strip the translations onto the blank illustrations, and print their own editions on local presses. The Primer is probably the world's most widely published agricultural text; 36 editions had been published in 30 languages by late 1986. For example, an Urdu edition of the book is available in Pakistan, Spanish editions in the Dominican Republic and Mexico, a Tamil edition in South India, Creole in Haiti, and Kiswahili in Tanzania. The Primer is also available in the following Philippine dialects: Bikol, Cebuano, Hiligaynon, Ilokano, Maguindanao, Pampango, Pangasinan, Tagalog, and Waray.

We previously surveyed 40 translators and copublishers in 12 Asian countries (1) and found that success in

copublication depends not only on cooperation among research centers, publishers, and translators but also on perceptions of the target audience. Translators and publishers considered farmers and extension agents as the main users of the Primer and of another widely translated IRRI book, *Field problems of tropical rice* (19 languages by 1986).

Huque et al (4) evaluated the effectiveness of English edition vs Cebuano edition of the Primer among 88 extension workers in Southern Leyte, Philippines. English is widely known in the Philippines, and all respondents were fluent in English. The knowledge level of extension workers increased significantly after exposure to both editions. The knowledge increase of those who studied the Cebuano edition, however, was significantly higher (0.01 level of probability) than those who read the English edition.

Since its release, cooperators have asked: Is *A farmer's primer on growing rice* really meant for farmers? Is the information too technical for effective transfer to low-literate farmers? How can the Primer be improved? We initiated this research to find answers to those questions as well as ways to improve communication in future extension-level publications.

OBJECTIVES AND HYPOTHESIS

The objectives of this study were:

- to determine the effectiveness of *A farmer's primer on growing rice* in Tagalog and Hiligaynon in the transfer of knowledge in rice farming technology among farmers;
- to test possible relationships among farmers' socio-demographic characteristics and communication variables, and the Primer's effectiveness in knowledge transfer;
- to evaluate farmers' perceptions of the book's design and message content; and
- to recommend improvements that will make a revised edition of the Primer more effective in technology transfer.

The null hypotheses were:

- There will be no significant difference between knowledge scores in tests given to farmers before and after exposure to the Primer.
- There will be no difference in the initial and final knowledge of farmers who read the entire Primer and those who do not finish the book.
- There will be no difference in farmers' initial and final knowledge scores in various subject areas covered by the Primer.
- There will be no relationship between knowledge gain and a farmer's:
 - age,
 - education,
 - training,
 - membership and position in organizations,
 - type of land tenure,
 - experience in rice farming,
 - exposure to print media (newspapers, magazines, agricultural publications, and comics), or
 - exposure to broadcast media (radio and television).

METHODOLOGY

Sampling

We tested the Tagalog edition in Cavite, a representative area where rice farming is the predominant occupation and Tagalog the major dialect. In consultation with the International Institute for Rural Reconstruction (IIRR), Silang, Cavite, seven barangays in three Cavite towns were chosen.

The Hiligaynon edition was tested in Negros Occidental, where rice farming is new. The area was chosen because most rice farmers there are displaced sugarcane workers who recently shifted to rice after the sugar industry collapsed. It was assumed that they had little or no knowledge of rice production. The provincial agriculturist of the Ministry of Agriculture and Food (MAF) helped identify five municipalities. One barangay or hacienda with lowland rice farms was selected from each municipality.

Random samples of Cavite and Negros farmers were selected based on the following criteria:

- The farmer must be cultivating an irrigated lowland farm.
- He must not have been previously exposed to the Primer.
- His primary language must be Tagalog (for Cavite) or Hiligaynon (for Negros).

We pretested 102 farmers, 41 in Cavite and 61 in Negros Occidental. However, we had only 84 farmers for the post-test. Four Cavite respondents could not be located during the post-test, and three did not read any portion of the book. In Negros, only 1 farmer did not read the book, but 10 could not be contacted during the post-test.

Instrument and data gathering

The experimental design used in the study was the classic pretest and post-test, with two sets of instruments. The pretest involved two sets of questionnaires: one for demographic and communication variables and one to test the farmers' knowledge of key rice-growing techniques. The purpose of the post-test — identical to the pretest — was to evaluate the effectiveness of the Primer in knowledge transfer.

The test was adapted from a Ph D study on "The relative effectiveness of two extension publications in English and Cebuano on change agents' cognitive and affective domains in rice technology diffusion" (3). The original test consisted of 80 items in 6 formats: simple recall, multiple choice, problem solving, matching, fill-in-the-blank, and true-or-false.

The test was pilot tested with five farmers in Trece Martires, a Cavite town outside the sample area. Some questions were then deleted and simplified. A test involving 73 items, from 10 to 14 items for each of the formats, was finally used to measure knowledge before and after exposure in one of two languages. The test covered most chapters of the Primer.

Each farmer was individually tested, then interviewed, in his dialect on sociodemographic, educational, and communication variables. Each farmer was then given a copy of the Primer in Tagalog or Hiligaynon.

Forty-five days later, the same interviewers conducted the post-test, then had the farmers evaluate the Primer's design, packaging, and message content.

Cabanilla, a Tagalog speaker, interviewed most of the farmers in Cavite. IIRR provided two additional interviewers (both BS graduates in agriculture with research experience) to finish the testing as quickly as possible to avoid the "radiation effect" during the testing period. For Negros, three interviewers from the MAF Regional Office in Bacolod City, plus the MAF translator of the Hiligaynon Primer, were hired. The interviewers were briefed on the objectives of the study and instructed in the appropriate testing procedures.

Data analysis

Analysis was done by simple frequency counts and percentages to measure observations on each test variable, chi-square tests to determine relationships among variables, and t-tests to determine the significance of means among variables.

The level of significance was set at 0.10; thus statistical values obtained at less than 0.10 alpha were considered significant, and values of less than 0.05 as highly significant.

Statistical tests were done with the MICROSTAT statistical package using an IBM microcomputer.

Variables

The following were the independent variables:

- Sociodemographic
 - age (number of years nearest the respondent's birthday at the time of study)
 - sex
 - marital status
 - birthplace (barrio, town, or city)
- Education
 - highest formal education completed by the respondent
 - previous participation in rice production training courses
 - membership and position in organizations
- Farming background
 - farming experience (number of years the respondent had grown rice before the test)
 - land tenure (owner, leaseholder, tenant, or displaced sugar worker)
- Communication (exposure to print media [newspapers, magazines, agricultural publications, and comics] and broadcast media [radio and television]).

The dependent variables were:

- initial knowledge score,
- final knowledge score, and
- knowledge gain.

RESULTS

Sociodemographic variables of the respondents

The respondents' ages ranged from 26 to 74; average age was 44 (Table 1). Cavite farmers averaged 46 yr old and Negros farmers, 42.

Only 4 of the 84 respondents were female. All Cavite farmers were married, but 14% of the Negros farmers were either single or widowers.

Eighty-one percent of the respondents were born in a barrio, and 94% still resided and farmed in the same barrio. About 25% of the Negros farmers were born in a town or a city, while all Cavite farmers were born in a barrio.

Educational background

Of the 61% farmers with formal education, half were elementary school graduates (Grade 6). More than a third did not finish elementary school, but 28% attended at least Grade 1 (Table 2). Although 11% had no formal schooling, about half of them could read. The four illiterate farmers asked their wives or children to read the book to them.

Thirty-two percent of the farmers had participated in rice production training courses in the past 3 yr. Thirty-eight percent of the Cavite farmers had participated in rice training courses, mostly sponsored by IRR; the 28% of Negros farmers with training had attended MAF courses.

Table 1. Sociodemographic characteristics of 84 farmer respondents, Cavite and Negros.

Characteristic	No.	%
Age^a		
Less than 36	19	23
36-55	52	62
More than 55	13	15
Sex		
Male	80	95
Female	4	5
Civil status		
Single	5	6
Married	77	92
Widow	2	2
Birthplace		
Barrio	68	81
Town	14	17
City	2	2

^aMean = 44.

Table 2. Background of farmer respondents in Cavite and Negros.

Background	No.	%
Highest education (n=84)		
None	9	11
Less than Grade 6	24	28
Elementary (Grade 6)	41	49
High school	9	11
College	1	1
Previous training (n=84)		
Yes	27	32
No	57	68
Membership in organizations (n=48)		
Yes	48	57
No	36	43
Position held in organizations (n=84)		
Officer	18	37
Member	30	63

Most Cavite farmers were members of farm, civic, or religious organizations; almost half had served as officers. Less than half of the Negros farmers were members of organizations.

Farming background

Only 1 of the 84 farmers owned the land he or she worked (Table 3). Seventy-six percent of the Cavite respondents were leaseholders. About 50% of the Negros farmers were tenants, and 14% were leaseholders. The remaining 36% were landless farmers who had previously worked on vast sugarcane plantations. For sustenance, these farmers had made temporary agreements with the landlords to plant rice on idle land. Although the landlords received no share of the rice, they could redirect the land to sugarcane if the crop were to become profitable again.

The respondents had an average of 14 yr of rice farming. Seventy-one percent of the Cavite farmers had more than 10 yr of rice farming; 62% of the Negros farmers had less than 10 yr. Most of the latter had shifted from sugar to rice farming in the past 2-3 yr.

Table 3. Rice-farming background of 84 farmers in Cavite and Negros.

Farming variable	Cavite (n=34)	Negros (n=50)	Both (n=84)
	%		
Land tenure			
Owner	0	2	1
Leaseholder	76	14	39
Tenant	24	48	38
Displaced sugar worker	0	36	21
Years in rice farming ^a			
10 or less	29	62	49
11-20	32	14	21
21-30	15	12	13
More than 31	24	12	17

^aMean = 14.**Table 4.** Exposure to print and broadcast media of 84 farmers in Cavite and Negros.

Type of media	Very often	Frequency (%) of exposure ^a			
		Often	Seldom	Very seldom	Never
<i>Print</i>					
Newspaper	0	1	14	44	41
Magazine	0	1	8	31	60
Agricultural publications	0	3	8	35	54
Comics	1	5	9	42	43
<i>Broadcast</i>					
Radio	12	28	43	11	6
Farm broadcast	2	14	53	17	14
Television	8	6	35	30	21

^aFor print media: very often = 6-7 d/wk; often = 4-5 d/wk; seldom = 1-3 d/wk; very seldom = <1 d/wk. For broadcast media: very often = 3 times/d; often = 2 times/d; seldom = once a day; very seldom = less than once a week.**Table 5.** Knowledge scores in rice technology of 84 farmers in Cavite and Negros before and after exposure to the primer.

Time	Knowledge level ^a					
	Low		High		Mean score	Range
	No.	%	No.	%		
Before treatment	81	96	3	4	26	15-41
After treatment	45	54	39	46	36	22-53

^at-value = 11.5622**.

Print media exposure

Most farmers had never read an agricultural publication, and 41% never read newspapers (Table 4). Only 1 respondent claimed to read newspapers and magazines 4-5 d/wk. Three Negros farmers who claimed to have very limited knowledge of rice cultivation reported to have read agricultural publications often; they acquired the publications through their own initiative to learn rice farming technology.

The main reason cited for not using print media was their nonavailability in the barrio. Farmers showed great interest in highly illustrated materials in local dialects.

Table 6. Knowledge levels in rice farming technology of 84 farmers in Cavite and Negros, by group (A = read the entire book, B = did not finish the book).

Classification of respondents	Knowledge level					
	Low		High		Mean score	Range
	No.	%	No.	%		
	<i>Initial^a</i>					
Group A	42	95	2	5	26	15-41
Group B	39	97	1	3	25	17-39
All	81	96	3	4	26	15-41
	<i>Final^b</i>					
Group A	13	30	31	70	39	23-55
Group B	32	80	8	20	32	22-39
All	45	54	39	46	36	22-55

^at-value = 0.7682 ns, ^bt-value = 5.1860**.

Broadcast media exposure

Exposure to broadcast media was relatively high: 94% listened to the radio, with 83% listening at least once a day; almost two-thirds of the farmers listened to farm broadcasts daily.

More than 90% of the Cavite farmers viewed television at least once a week, and 71% daily. A third of the Negros farmers had never really watched TV; they lived in areas with no electricity.

Effectiveness of the Primer

Effect of the Primer on knowledge scores. The hypothesis tested was that exposure to the Primer would have no significant effect on the difference in farmers' pretest and post-test knowledge scores.

Scores of 0-36 on the 73-item test were categorized as "low," and scores of 37-73 as "high."

The pretest mean of the 84 respondents in Cavite and Negros was 26, with a range of 15-41; the post-test mean, after exposure to the Primer, was 36, ranging from 22 to 53. Although only 4% of the subjects had high knowledge of rice technology before the treatment, 46% had high knowledge in the post-test (Table 5).

The t-test analysis showed that the means of the pretest and post-test scores differed significantly for both the Tagalog and Hiligaynon editions. We can conclude, therefore, that the Primer effectively transferred knowledge in rice technology to the farmers.

Knowledge scores by group. A little more than half of the subjects read the entire book during the 45-d exposure period. We compared performances in the pretest and post-test of farmers who finished the book (Group A) with those of farmers who did not (Group B).

The initial knowledge scores of almost all farmers in both groups were low (mean score, 26; Table 6). The t-test showed no significant difference in the initial knowledge of the 44 farmers who finished the book and the 40 farmers who did not, but the mean scores differed significantly after the treatment.

Only 5% of the farmers who read the Tagalog and Hiligaynon editions completely had high knowledge of farming technology before reading it, but 70% had high knowledge afterwards (Table 7). Of those who did not finish the book, 3% had high knowledge before, and 20% after the treatment.

Although knowledge level increased significantly among the total sample of 84 farmers, the overall increase was only about 38% because of Group B's low knowledge gain. But the mean score of those who finished the book increased 50% (from 26 to 39 on the 73-item test). The mean difference for Group A was highly significant.

The percentage of high post-test knowledge scores increased with increased number of pages that the farmers read. The high scorers increased from 6 to 69% as the number of pages read increased from 40 to 221 (Table 8). Mean scores increased from 31 to 39.

Thus, overall knowledge gain among the 84 farmers would probably have been higher if all farmers had read the entire book.

Knowledge scores by subject matter. The 73 questions were categorized into the following topics covered in the Primer: fertilizer, carbohydrate production and water, parts and life cycle of the rice plant, seeds, and weeds.

The initial mean knowledge scores for all topics were relatively low: 3.6 for fertilizer, 4.4 for carbohydrate production, 10.0 for parts of the rice plant, 6.0 for seeds, and 2.0 for weeds. The highest possible scores for those topics were 15, 9, 25, 17, and 7, respectively. Knowledge gain was highest 86% in the fertilizer topic (Table 9).

Table 7. Knowledge levels in rice farming technology of 44 farmers who read the entire Primer (Group A) and of 40 farmers who did not finish the book (Group B), before and after treatment.

Time	Knowledge level				Mean score	Range
	Low		High			
	No.	%	No.	%		
	<i>Group A^a</i>					
Before treatment	42	95	2	5	26	15-41
After treatment	13	30	31	70	39	23-55
	<i>Group B^b</i>					
Before treatment	39	97	1	3	25	17-39
After treatment	32	80	8	20	32	22-39

^at-value = 12.0157**, ^bt-value = 5.6835**.

Table 8. Knowledge scores of 84 rice farmers in relation to number of pages read.

Pages read	Respondents (no.)	Knowledge level				Mean score
		High		Low		
		No.	%	No.	%	
Fewer than 100	17	1	6	16	94	31
100-200	22	7	32	15	68	33
More than 200	45	31	69	14	31	39

Although almost all farmers were aware of numbers such as 24-12-12 printed on fertilizer bags, only 15% knew that those numbers meant percentages of nitrogen, phosphorus, and potassium. After reading the book, half of the farmers understood what the numbers meant.

The least interesting or relevant topics for the farmers were carbohydrate production and water, parts and life cycle of the rice plant, and weeds. Farmers did not consider the carbohydrate section relevant to their needs and claimed that weeds were not a serious problem in their areas.

Knowledge gain and farmers' characteristics. We tested relationships between the farmers' knowledge gain in rice technology after reading the Primer and their sociodemographic and educational background, farming experience, and exposure to media. Fourteen independent variables were studied. The chi-square test was used to analyze the relationships.

The farmers' knowledge gain was measured by the difference between the pretest and post-test scores on the 73-item test. The mean difference was 10 additional correct answers in the post-test. Therefore, the knowledge gain of farmers who answered an additional 0 to 9 questions correctly in the post-test was considered low, and that of farmers who answered 10 or more additional questions correctly was considered high.

Four of the 14 variables -- prior participation in rice training courses, type of land tenure, number of years in rice farming, and exposure to newspapers -- were significantly associated with knowledge gain among the 84 farmers (Table 10).

Of the 27 respondents who had previously participated in rice training courses, 70% had high knowledge gain in the post-test vs 42% of those who had had no training (Table 11).

In Negros, the relationship between knowledge gain and land tenure was highly significant. The knowledge gain of displaced sugar workers was 78%. In Cavite, no significant association was found between knowledge gain and land tenure.

Farmers who read newspapers, including those who "seldom" read them, gained more knowledge from reading the Primer than those not exposed to newspapers. Knowledge gain was low among the 64% farmers who never read

Table 9. Mean scores of 84 rice farmers by topic.

Topic	Mean scores			
	Maximum score	Pretest	Post-test	% increase
		score		
Fertilizer	15	3.6	6.7	86
Carbohydrate production and water	9	4.4	6.0	36
Parts and life cycle of the rice plant	25	10.0	12.4	24
Seeds	17	6.0	8.4	40
Weeds	7	2.0	2.4	20

Table 10. Tests of relationship between independent variables and knowledge gain in rice technology after reading the Primer.

Independent variable	df	Chi-square	Significance ^a
Age	3	0.232	ns
Sex	1	0.953	ns
Membership in organizations	1	1.001	ns
Education	3	3.720	ns
Training	1	5.858	**
Land tenure	3	7.285	*
Years in rice farming	3	12.910	**
Exposure to print media			
newspapers	2	6.063	*
magazines	2	1.306	ns
agricultural publications	2	3.357	ns
comics	2	1.179	ns
Exposure to broadcast media			
radio	4	4.244	ns
TV	4	3.180	ns
farm broadcasts	4	2.724	ns

^ans = not significant, * = significant at the 10% level, ** = significant at the 5% level.

newspapers, but high among farmers who read newspapers at least 4 times a week.

The relationship between education and knowledge gain was highly significant in Cavite, but not among the displaced sugarcane farmers in Negros, whose enthusiasm and eagerness to learn to grow rice better seemed more influential than education (Table 10).

Farmers' attitudes toward the Primer's design and message content

"Design and book packaging" refers to the Primer's illustrations, layout, and labeling. "Message content" refers to how the words and presentation of text were comprehended. Semantic differential was used to measure the farmers' attitudes. The instrument consisted of adjectival pairs of words such as "attractive-unattractive" or "appropriate-inappropriate" to which farmers reacted on a negative-positive scale of five points (2).

The farmers rated almost all characteristics of the Primer as favorable, so we dichotomized their responses as "highly favorable" and "favorable." Attitudinal scores within the average of the mean and above were classified as highly favorable, and scores below the mean as favorable. The mean score in 3 of the 6 scales to measure attitude toward some general aspects of the Primer exceeded the average mean of 4.6.

Although the farmers considered the Primer highly appropriate, with legible letter size and proper illustration size, they were less enthusiastic about the cover, the labeling of illustrations, and size of the book. Some farmers said the cover illustration was too abstract, and specifically mentioned the nonconventional depiction of a ricefield (Fig. 1). The cover design confused some farmers—they wanted to know if it illustrated a modern rice planting method. Farmers wanted the cover to be attractive, but as simple and "natural" as possible.

Table 11. Knowledge gain in rice technology after reading the Primer, and previous participation in rice production training, land tenure, exposure to newspapers, and education.

Variable	Knowledge gain				Chi-square ^a
	High		Low		
	No.	%	No.	%	
Previous training					
Yes	19	70	8	30	4.782**
No	24	42	33	58	
Land tenure					
Owner	0	0	1	100	7.285*
Leaseholder	15	45	13	55	
Tenant	14	44	18	56	
Displaced sugar worker	14	78	4	22	
Exposure to newspapers					
Often	2	100	0	0	6.063**
Seldom	29	59	20	41	
Never	12	36	21	64	
Education					
None	4	44	5	56	3.038ns
Less than Grade 6	10	42	14	58	
Elementary (Grade 6)	24	59	17	41	
High school	5	56	4	44	
College	0	0	1	100	

^ans = nonsignificant, * = significant at the 10% level, ** = significant at the 5% level.



1. Cover of the Hiligaynon edition of the Primer.

Some farmers also suggested printing the Primer — currently 15 × 22.8 cm — in a smaller format so they could conveniently take it to the field.

Text and illustrations. Farmers liked the text, illustrations, messages, and consistency of text with illustrations, but made these specific suggestions for improvement:

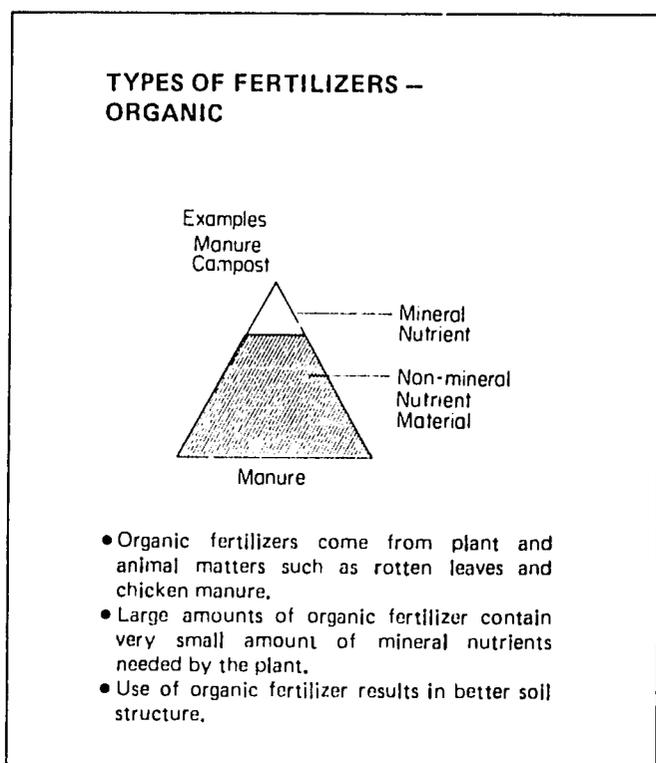
- Some illustrations are misleading; for example, in one illustration (p. 3) a rice tiller seemed to have sprouted directly from the stem.
- Abstractions were confusing and hard to understand, e.g., the use of a triangle (Fig. 2). The farmers preferred illustrations of “real” objects to which they could relate.

Almost all farmers found the illustrations in the carbohydrate section hard to understand, and few considered the information relevant to their needs.

The farmers generally misunderstood and were critical of Tagalog and Hiligaynon translations of technical terms in the Primer; many said that they differ from local terms and seem like “English” words.

Message content. The means of 5 of the 8 farmers’ evaluations exceeded the average mean of 4.69 (Table 12), indicating that farmers considered the Primer’s messages highly interesting, credible, relevant, practical, and useful. But newness, adequateness, and practicality were rated less favorably.

Cavite farmers rated “newness of information” in the Primer relatively lower than did the less experienced Negros farmers.



2. Abstractions such as this pyramid (English edition shown here) confused many Cavite and Negros farmers.

On adequateness, farmers felt that IRRI should introduce information on the following areas into the Primer:

- **Variety.** What types of varieties should farmers plant for specific seasons, locations, and cultural and management practices?
- **Fertilization:**
 - use of indigenous organic fertilizers instead of chemical fertilizers
 - sources of organic fertilizers and their proper use
 - proper amounts of fertilizer to apply

Table 12. Farmers’ evaluation of the Primer’s design and message content.

Trait	Scale					Score	Rating ^a
	+2	+1	0	-1	-2		
	(no. who rated)						
<i>General</i>							
Appropriateness of book title	65	18	—	—	—	397	4.78
Attractiveness of cover design	57	22	4	—	—	385	4.65
Adequateness of labeling	50	32	1	—	—	381	4.59
Legibility of letter size	58	22	2	—	1	385	4.64
Proper size of illustration	56	27	—	—	—	388	4.67
Convenient size of book	52	26	1	4	—	375	4.52
Mean rating							4.64
<i>Test and illustrations</i>							
Words used (common)	38	31	6	3	—	338	4.07
Technical terms defined (clear)	39	34	5	4	1	337	4.06
Textual work (adequate)	50	31	2	—	—	380	4.58
Illustrations used (adequate)	55	27	1	—	—	386	4.65
Text vs illustrations (consistent)	55	27	1	—	—	386	4.65
Message order	55	28	—	—	—	387	4.66
Mean rating							4.44
<i>Message content</i>							
Newness	46	32	3	2	—	371	4.46
Adequateness	48	33	—	2	—	376	4.53
Interesting	64	19	—	—	—	396	4.77
Credibility	67	16	—	—	—	399	4.81
Relevancy	61	22	—	—	—	393	4.73
Persuasiveness	53	30	—	—	—	385	4.63
Practicality	66	12	4	1	—	392	4.72
Usefulness	76	7	—	—	—	408	4.91
Mean rating							4.69
<i>Comprehensibility of message</i>							
General words easy to understand	34	33	14	2	—	348	4.19
Technical words comprehensible	17	32	21	11	2	300	3.61
Symbols simple enough to be understood	31	28	9	10	4	318	3.83
Outcome of a process can be predicted	35	27	16	5	1	342	4.12
Cause and effect well demonstrated	32	35	6	6	7	337	4.06
Mean rating							3.96

^aCalculated by assigning a weight of 5 to those who rated “+2” down to 1 for those who rated “-1.” Totals for each category were then divided by the number of farmers who rated.

- Soil types, appropriate varieties for specific soils, and proper conditions for planting
- Prevention or control measures for specific insects and diseases
- Alternate crops to grow with rice
- Cultural and management practices for nonirrigated areas
- Weed control measures

The farmers evaluated some Primer messages as impractical:

- Specifying water requirement in million liters. Farmers suggested that this information be presented in practical terms such as depth across 1 ha (i.e., "knee-deep" or in feet or inches).
- Carbohydrate production. Farmers were neither familiar with nor interested in carbohydrates, and they misinterpreted most of the illustrations. For example, a farmer interpreted the cross-section of an enlarged cell as a leaf infested with insect eggs.

Half of the farmers who did not finish the Primer stopped at the carbohydrate-food production section. Others who skipped it and proceeded to the next section were classified as having "finished" the book.

Farmers comprehended most of the general words used in the Primer, but some found familiar words hard to understand when used differently in the book, e.g., *arina* (starch or flour), *asukal* (sugar), and *taba* (fat).

Farmers rated their own abilities to understand technical words, symbolic forms of presentation, and demonstrations of cause and effect as low. They suggested more detailed explanation if technical words are necessary.

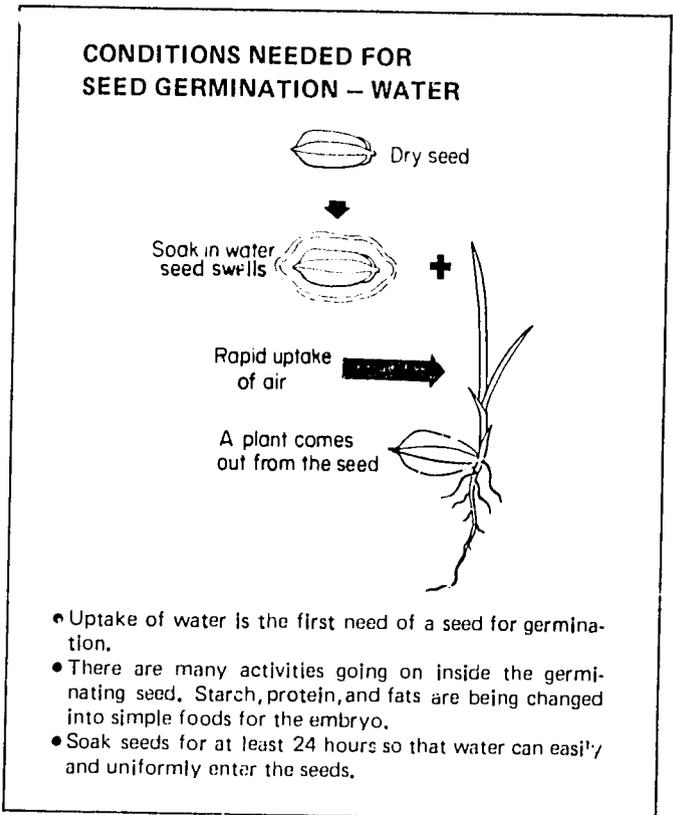
Farmers also found symbols such as "+," "-", and "→" hard to comprehend (Fig. 3). The "plus" sign was sometimes interpreted as something to avoid because it is like the "danger" sign ("×"). The farmers suggested using simple words such as *at* (Tagalog for "and") for the "+" sign. If symbols must be used, they should be supported with more text.

DISCUSSION

There are many lessons to be learned from extension workers and farmers who use *A farmer's primer on growing rice*. Some findings were hard to quantify statistically. Many farmers, particularly in Negros, walked 15-20 km to where Cabanilla was interviewing to volunteer to be interviewed so they could get a free copy of the Primer. We gathered no data on their income, but we know they are poor by almost any standard. Yet most of these low-literate farmers studied the Primer and learned from it.

The following are issues and problems IRRI and national cooperators might consider when preparing future farm-level materials:

- **Distribution.** Most farmers in our sample had never read an agricultural publication, and none had heard of



3. Symbols such as "+" and "→" were often misunderstood by Cavite and Negros farmers.

the Primer before our research. No international agriculture research center or Third World agricultural agency can afford to distribute free copies of materials such as the Primer to millions of farmers. Nonprofit sale seems to be the only way to reach farmers who want such information. Farmers said they would pay for publications to help them increase their rice production. We asked how much they would pay for the Primer; the mean price quoted was US\$1.50 (₱31.00). IRRI's current price is US\$1.30 (₱26.00)/copy (minus a 40% bookseller's discount). IRRI plans to print some editions on newsprint to cut production costs further.

There are few bookstores in the rural areas of Asia, Africa, and Latin America — and farmers do not go to bookstores. Farmers suggested agricultural supply stores as distribution outlets for the Primer and similar publications. By late 1986 IRRI had made distribution arrangements with 11 farm supply stores in the Philippines, plus 14 other nonconventional outlets such as church or women's organizations, agriculture professors, and extension agents.

We should also publish basic pamphlets that are shorter and cheaper. Such pamphlets should be highly illustrated so we can make copies of the artwork available to national programs, which can then add translated text and print local editions.

- **Follow-up.** Farmers often claimed the need to supplement their readings of the Primer with meetings with agricultural extension agents, who could answer key questions.
- **Translation.** Farmers said that many Tagalog and Hiligaynon translations of technical terms seemed like English words. Accuracy of translation is difficult to control, particularly in the Philippines. A vast range of terms are used within, for example, a geographic area where Waray is the main language. In each region, one or two neighboring languages have crept into the local dialect. IRRI has a "checker" examine each translated manuscript — but if the checker and translator are from regions 50 km apart, the checker invariably claims the translation is wrong and not "pure."

Furthermore, there are no standard reference texts for proper use of most Philippine dialects. The claim that technical terms in the translations sound "like English words" is probably valid. Translators of IRRI publications often must create new terms — because there are no appropriate words in the local dialect.

The authors can present no practical solution to this problem.

- **Design and message content.** IRRI is using findings of this study to make forthcoming publications, designed on the Primer concept, more effective. These publications include:
 - *A farmer's primer on growing upland rice*
 - *A farmer's primer on growing cowpea on riceland*
 - *A farmer's primer on growing soybean on riceland*
 - A revised edition of the current Primer
 - *Helpful insects, spiders, and pathogens — friends of the farmer*
- **Visual literacy.** IRRI is initiating a more comprehensive study of visual literacy among low-literate farmers. The comprehension of illustrations only (no text) from the new Upland rice primer will be tested among upland rice farmers in Batangas, Philippines.
- **Questions.** Farmers tended to answer certain questions incorrectly in both the pretest and post-test for both editions. Were the answers incorrect because of difficulty or lack of interest in the subject matter — or because we did not phrase the questions properly? We have rephrased the most "difficult" questions and will re-test them with farmers elsewhere.
- **Women.** Through informal discussion, we learned that the wives of many farmer respondents read the Primer at least as comprehensively as did their husbands. Wives often claimed to have subsequently discussed what they learned from the Primer with their husbands. More research should be done on the role of women in the diffusion of agricultural technology.

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