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Re: Drying / Storing
Problems,
Accel. Rice Produc
tion Proj. Laos

REPORT TO AID/W
on
CONSULTATION ASSIGNMENT
with
USAID/LAOS

10p

September 15 - 28, 1968

Services Rendered
Under the Agreement
Between
AID/W and MSU
AID-W-607

SEED TECHNOLOGY LABORATORY
Mississippi Agricultural Experiment Station
Mississippi State University
State College, Mississippi 39762

October, 1968

RICE DRYING, STORAGE, AND MILLING IN LAOS

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USAID/Laos requested that one of the specialists from the Seed Technology Laboratory, Mississippi State University, review the present practices for rice drying, storage and milling in Laos. The assignment was under taken by the author under provisions of contract AID-W-607 between AID/Washington and Mississippi State University, and in connection with an assignment with USAID/Indonesia. This report covers observations made during the visit, and recommendations related to the rice problems.

Background

An inadequate supply of rice is one of the major problems in providing an ample diet for the population of Laos. To help increase rice production, new varieties that are responsive to fertilizer and yield two to four times that of the native varieties are being developed and introduced. These new varieties have a shorter growth period and are not sensitive to photoperiod. Thus, where irrigation is available two crops can be produced on the same land each year.

Along with the problem of increasing rice production, there are several related problems that demand attention: (1) when two crops per year are produced, the dry season crop is usually harvested at the beginning of the wet season and is difficult or impossible to dry by traditional methods; (2) storage space must be adequate for any substantial increase in production; (3) an adequate distribution and transportation system is needed to move grain from the producer to the markets; (4) as the supply of rice becomes more plentiful, the consumers will become more selective with respect to grain quality - therefore, it is necessary that the milled rice for food consumption be of good quality.

It was with these problems in mind that the rice drying, storage, and milling facilities and practices in Laos were reviewed.

Present Conditions

The farmers of Laos are making good progress in increasing rice production. Many of them are beginning to use recommended production and protection practices. At one meeting the author attended, 21 farmers were present and 11 of them had used fertilizer for the first time last season. The USAID advisors are to be commended for their assistance and guidance in these programs.

Visits were made to the Salakham Research Station, Luang Prabang, Phone Hong, Ban Kuen, Sithantay, and Ban Simano areas (location sketch

attached). All the rice is harvested by cutting the heads by hand, tying them into bundles, and then spreading the bundles on the ground to dry. It is then threshed by hand or by small threshing machines. Rough rice is stored in various places such as small wooden houses, or in large woven baskets protected from the weather by placing them under the houses or by building a roof over them.

Space for storage of the anticipated increase in production is very inadequate. The Agricultural Development Organization has constructed enough warehouse storage for 4200 tons, but this is only a small fraction of what will be needed when more farmers begin planting seed of the high yielding varieties and using fertilizer.

Most of the rice is milled by small huller-polisher mills located in the villages. Mills visited were milling a native variety and at least 60% of the milled grains were broken. This excessive breakage could be caused by improper drying, inherent characteristics of the rice, or improper milling procedures. Some millers keep the bran as payment for milling. In these cases, they tend to mill the rice closer and as a consequence more grains are broken. There is a definite need for larger and more efficient rice mills in Laos.

Laos has a poor road system which makes it difficult to move rice from surplus to deficient areas. Also, since Laos is surrounded by other countries and does not have a seaport, there appears to be

little hope for exporting rice in the immediate future even if they were able to produce a surplus.

Even though there is some dissatisfaction with the IR-8 variety of rice due to the high percentage of breakage when it is milled, it has served a most worthwhile purpose in demonstrating to the farmers that higher yields can be obtained by the use of inputs and that it is possible to produce two crops per year when irrigation is available.

Recommendations

As the production of rice is increased, additional facilities for drying, storage and milling will be needed. Since most farms are small, the transportation system poor, and educational level low, simplicity should be a major factor in planning facilities for construction in the immediate future. With these conditions in mind, the following recommendations are offered:

1. With good progress being made in increasing rice production, more emphasis should now be placed on drying, storage and milling of rice. The mission could provide valuable assistance in these areas by employing a technician well trained in drying, storage, and milling.
2. Continue the use of natural or sun drying when possible. However, due to the susceptibility of some varieties to

sun checking, greater care should be exercised during drying to reduce checking (see recommendations given in "Report on Poor Milling Recovery of Rice" by J. E. Hawes, July 24, 1968).

3. For artificial drying, the box or flat bed dryer would be more suitable at this stage. Specifications for this type dryer are given in the "Report on Rice Drying in South Vietnam" by R. A. Sauls, N. C. Ives, and W. V. Hukill, IADS, USDA. 1968.
4. Research work on harvesting, drying, and milling of rice should be started. A laboratory located at the Salakham Rice Experiment Station could be used for research and training. The laboratory should be equipped with a small model drier, electronic moisture tester, seed germinator, small seed cleaner, test screens, laboratory model rice mill, and rice sizing sieves. If the three metal bins at Salakham were equipped with perforated floors, fans, and supplemental heaters, they could be used for drying the rice produced at the Experiment Station.

NOTE: If desired, assistance with plans and specifications for the laboratory and equipment, and the materials and equipment needed to convert the metal bins to dryers can be provided on request by the Seed

Technology Laboratory, Mississippi State University, State College, Mississippi 39762. The author discussed with Dr. Bell the ways in which the Seed Technology Laboratory might assist in developing plans for a seed testing and milling laboratory at the Salakham Research Station.

5. The farmers should be encouraged to enlarge their on-the-farm storage space until such time as adequate centralized storage is available. Woven baskets, bins, and wooden buildings can be constructed by local labor with materials such as bamboo and lumber at a minimal cost. Some incentives might be offered to the farmers to store their rice and release it to the market later. The farmers should also be instructed in the importance of marketing high quality rice, free of foreign matter, insect damage, etc.
6. Millers should be instructed in the proper operation of their mills so as to produce the highest yeild of head rice. The extension service of RGL could provide this service by installing a medium size rice mill with engine on a trailer so that it could be moved from village to village. The proper operation of the mills and the effects of the different adjustments on the yield of head rice could be demonstrated on-the-spot to the millers. The

technicians could then show the millers how similar adjustments can be made on their mills for most efficient operation. This method of instruction should be most effective because the millers appear to be very reluctant about making changes in the adjustments of their mills. Actual demonstrations of proper milling procedures and adaptation of them to fit local mill situations should increase the miller's receptivity to change.

7. Because of the small size of farms, it is beyond the financial means of the individual farmers to purchase drying equipment if and when artificial drying becomes a practice. Associations or groups of farmers, however, might pool their resources and develop a cooperative facility. Warehouses such as those being constructed by ADO could serve as a nucleus for organizing farmer co-operatives to develop facilities for drying and storing rice. It is well to keep in mind, however, that cooperatives are successful to the extent that they are truly cooperative ventures and are managed properly.
8. The Laotian Government should begin establishing grading standards for marketing rice. Since the world market for rice is pretty well based upon Thailand's rice quality

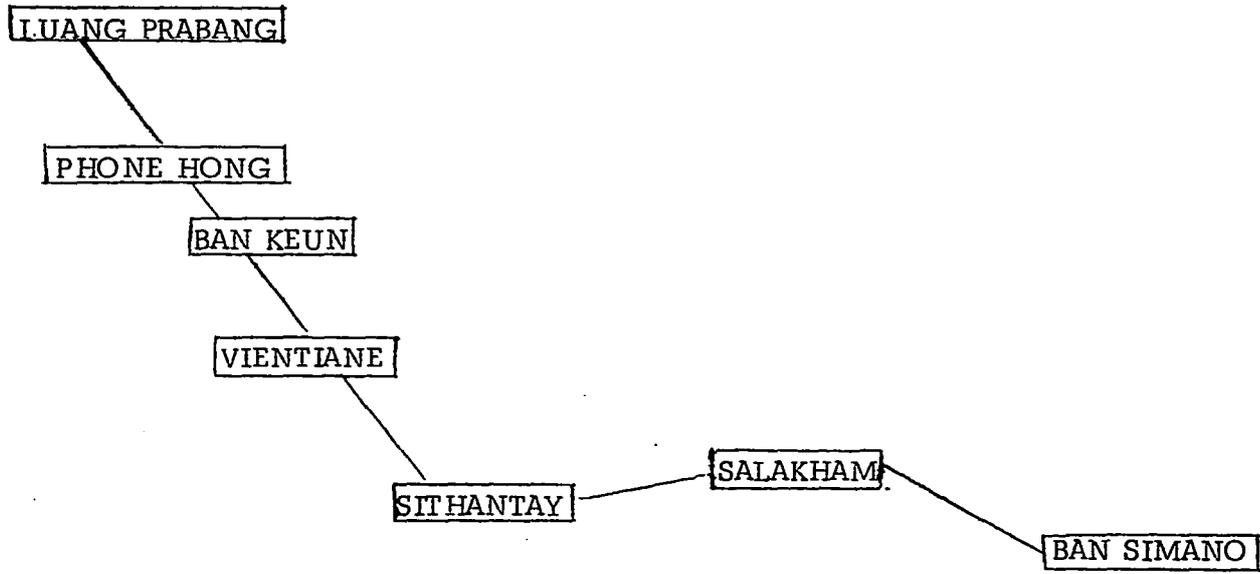
standards, it would be well to use them as a guide for establishing grading standards in Laos.

9. There is a good possibility that Laos will have adequate rice production for its own needs within 3 to 4 years. As the point of self sufficiency is approached, it would be well to begin investigating the potential for production of other crops such as corn, peanuts, fruits, potatoes, and vegetables. Large volumes of these items could be absorbed by the local markets.

The author is grateful for the excellent cooperation of USAID/Laos and the Laotian Government during the period of this assignment.

October 28, 1968
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LOCATION SKETCH