PRACTICES USED BY SMALL FARMERS IN SELECTING AND MAINTAINING THEIR OWN SEED[1/]

What do we really know about the small farmers and his seed ? Are we sure that the seed which we have is definitely better for him ? Small farmers have developed mechanisms from the beginning of crop cultivation to select and maintain their own seed. We have to admit that they have been successful in this activity or we would not be here today. Thus, we must approach this subject with a great deal of humility. We need to be sincerely interested in learning what the small farmer does and why he does it before we can prescribe improvements. My undertaking is to help us start to think about how the small farmer selects and maintains his seed and to provide a way for us to share experiences and understandings. My vision of this topic is limited to what I have read, observed and experienced. Never having walk in the exact steps of all small farmers, I cannot know exactly what they do or why they do it.

In approaching this topic the nearest I can come to walking in the small farmer's path is to review seed selection and maintenance methods used on a U.S.A. farm in the 1930's. This farm was typical of many small and medium sized farms in the middle western part of USA at that time. Farmers went to the field just before harvest and selected the largest ears of maize with the objective of saving them until the next planting season. I have done this. The seed shows were developed to help stimulate interest and encourage farmers to select the most uniform and largest group of ten ears.

1/ Johnson E. Douglas, Head, Seed Unit, CIAT. Presented at the Workshop on "Improved Seed for Small Farmers" , CIAT, Cali, Colombia, August 9-13, 1982.

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Out of this kind of process by lending farmers came local native selections such as Rieds Yellow Dent and Johnson County White. Our selected seed were kept in a storage room in the house in racks that had metal plates at the bottom to prevent the mice from getting to the seed. In that way the seed dried gradually. In the early spring just ahead of planting these ears were hand shelled. The kernels on the ends of both ears were shelled and discarded do only the middle kernels of the ear were saved. This method meant that no seed grading was necessary. Samples of this seed were placed in rag dolls. These were really two cotton clothes with seed between them. They were placed behind the stove for five days to check to see if the seed germinate well. No seed treatment was used but the seed was planted hoping it would produce another crop and the same procedure was used for seed selection next fall. How does this compare with what millions of small farmers do today ?

The small farmers throughout this world frequently follow similar practices because most of them realize that their survival and that of their family rests upon having some kind of planting seed each season. When we talk about the small farmer's seed saving methods, we must first realize that in many areas it is really the small farmer's wife who does this work. When we discuss changing the seed being used by the small farmer, we must really be considering how to convince his wife that the seed we have is better than what she has saved.

Small farmers do not want to discard anything that may produce grain in their field. Therefore, roguing a field to make the crop more uniform is not practiced normally.

Sometimes diseased plants may be removed from fields, but even when this is practiced, it is usually done without a clear understanding of the characteristics of the disease and whether or not removing a plant will have any effect upon the disease infestation the following year. I have observed families removing smutted heads of wheat when I was sure that the number of spores already introduce into the field had contamined the next crop. The removal process was a total waste of effort.

Most seed is hand harvested when the general crop is harvested. Because of this practice mechanical damage and weed seeds usually are not a serious problem.

The seed is normally threshed by hand or animal power, the drying and storage of the seed is more of a problem in sub-tropical and tropical regions than it was in Indiana because of the high temperature and the high humidity conditions and the resulting adverse affect on germination. Sun drying is universally done. Cleaning is done by hand. Frequently, the seed of small farmers has a nice appearance. This is an important point because anyone offering seed to the small farmer must have seed that looks as good or better than what he already has. He does not see the genes and the yielding capability within that seed. He only sees, how it appears.

Farmers have solved their insect control and storage problem in a large number of different ways depending upon the area, materials available and the length of time that seeds have to be store. Maize ears are stored both with and without the husk and are hung from the ceiling if the quantity needed is small. Larger quantities are stored in traditional thatched timber or mud-brick stores. Storing seed in baked clay containers is the common method for many kinds of crops. Rice, wheat and barley

are frequently stored with the heads unthreshed in bunches that are hung from the ceiling. Often the storage location is in the house and near the cooking area because that is the driest place in the house. Insect pressures in these conditions make seed storage by the small farmer a problem. Insect control is managed without chemicals. A common method is to mix the seed in ash which has the double purpose of inhibiting insect development and serving as a dissecant for maintaining the lower content in the seed. Small farmers are often successful in the storage methods because they are dealing with small quantities of seeds. This problem becomes much more difficult when government and seed enterprises attempt to store larger quantities of seed in the tropics because they cannot use the small farmers methods but have to achieve the same objective in keeping large quantities of seed dry and free of insects.

Although the germination test can easily be done in soil, sand or a rolled towel, seed surveys have tended to find that it has not been done as a routine practice. No seed treatment is normally used. The seed saved is planted with faith that it will grow and produce another crop which is as good or better than the last one. The small farmer frequently plants a higher population than is recommended locally by the experiment station because he wants to be sure that he gets a crop and knows in his situation it is better to do this because of the hazards of insects, diseases and the weather.

Do we know how good his planting seed really is ? It is difficult to find information on this question. To my knowledge very few attempts have been made in developing areas to accurately assess the quality of the seed saved by small farmers.

Wheat seed surveys have been made in India and Tunisia but these results are not published. From this information, it appears that the germination of seed saved by small farmers in general was not bad, but a small percentage, say 5 to 10 percent of the samples, were low enough in germination to seriously affect the possibility of getting a good crop. Although most seed lots were relatively free of weed seed, some occasionally were found with excessive quantities of weed seeds. However, since the farmer is using his own seed, he was only planting back the weed seed he already had and he was not introducing new types. The identity of the variety or type used was often much less certain and was frequently mixed with something else. More information is needed on the quality of the farmers own planting seed. Such information can be useful to extension programs and seed suppliers.

Programs to introduce seed of the new varieties have failed because the seed supply was of poor quality and certainly a lower quality than the seed normally saved by the farmers. Dr. Norman Borlaug, CIMMYT, sites a number of examples of this kind and many of you are probably also aware of similar problems. It has frequently been said that the primary competitor of seed introduced as improved seed, certified seed, fisicalized seed or whatever official type of seed may be promoted is the farmer's own seed. Improvements can be made over the quality of seed saved by the small farmers. Not only does a variety have to be better but the seed itself must be equal to or better than the farmers own seed to be successful as one mounts an extension or promotion activity that will convince the farmer, or his wife to change.

All of the projections show that more mouths are to be fed. The quality of seed planted of improved varieties is an essential factor in determining how successful we are in increasing production to meet that need . We must consider how the farmers own seed can be improved as well as assure that the seed supplied from outside his farm is good quality. If we are successful in improving the variety and the quality of seed planted by millions of small farmers, we will help fill the stomachs of millions of people.

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