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**METHODS OF IMPROVING COTTON BY SEED
SELECTION ON THE FARM**

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The importance of using improved cottonseed is too often underestimated by the farmer. Farmers often plant any kind of seed regardless of its quality, purity and adaptation to soil and climatic conditions. We should go very slow in introducing new varieties from other sections of the country. The seed may have been grown under soil and climatic conditions quite different from that in Oklahoma, and may not be adapted to Oklahoma conditions. There is also danger of introducing cotton diseases. Only seed of known variety and selected because of desirable qualities and that are adapted to the local conditions should be planted.

One Variety for a Community

The first step to take in selecting cottonseed is to decide upon the variety that is best suited to the locality. In most sections of Oklahoma two or more varieties have already been tested, and you will no doubt be able to determine which is best adapted to your conditions. Such varieties as Mebane's Triumph, Rowden, Lone Star and Acala have been grown successfully in this State. It is best to grow only one variety of cotton in a locality. Where more than one variety is grown there is great danger of the seed becoming mixed at the gin and cross-pollinated by insects in the field. There are a number of other reasons why it is best to grow only one variety in a community, and among these is that pure seed of these varieties may be sold in large quantities and a market established at a higher price than the commercial value of the seed. Another reason is that cotton of uniform staple and good quality can be grown in a whole section and a higher price may be established for the staple in that section.

Home-Grown Seed the Best

There is a mistaken idea among many farmers that if cotton is grown on the same farm continuously it will "run out". Results with carefully selected varieties of cotton show that strains of cotton become more adapted to local conditions the longer they are grown and selected in a community. What is known as "run out" condition in cotton is not due to

having been grown in one place, but rather to lack of selection. They have become overrun with unproductive and undesirable plants. These unproductive and otherwise undesirable plants not only reproduce their kind, but intercross with more productive plants. Some seedmen and growers have an idea that old varieties will run down if they do not receive new blood now and then. In order to obtain new blood another variety is brought in and mixed with the run-down variety. One variety is supposed to intercross and produce a better variety. The need here is not new blood, but pure blood. Our varieties of cotton already have too many mixtures. In order to produce and maintain a uniform variety, mixing of seed and promiscuous crossing must be avoided.

Type of Plant to Select For

Before beginning to select cotton for seed you should study the type of plant best adapted to your locality. Of course the type varies with the variety of cotton, and after you determine the variety you wish to plant, then you should determine the best type of plant in that variety. As a rule the type of plant best adapted to Oklahoma conditions is one that has the primary or vegetative limbs close to the ground. The vegetative branches should not be too long and not over five in number. The vegetative limbs or branches can be distinguished from the fruiting branches as they do not bear any blossoms or bolls on the main stem, but have fruiting branches which grow from them which produce the fruit. The fruiting branches do not produce any other branches. The first fruiting branches should be low and continuous growing with several bolls on them. The joints on the main stem and vegetative branches should be close together; that is, the internodes should be short and the fruiting limbs should grow in successive joints. The bolls should be large, containing five locks, and should be storm resistant and easy to pick. There should be a large number of bolls on the stalk. The lint should be of good quality, uniform in length, and for upland, short-staple cotton, the lint should be about 1 1-16 inches long. The linting percent should be from 38 to 40.

METHODS OF COTTON SELECTION AND BREEDING OUTLINED

A Simple Method of Selection

This method is recommended for farmers who cannot afford to devote as much time to cotton breeding as the plant-to-the-row method would require. The farmer should first secure good seed that has been grown under as nearly his local conditions as possible and plant his crop from this seed. In the fall before the first picking, go through the field with bag and select plants conforming more nearly to the type you have in mind, picking the cotton from the selected plants. Pick only well-opened bolls from the center of the stalk. All bolls at the top of the stalk and ends of the limbs, even though well open, should be rejected, for the chances are that they are immature. Cotton for seed should not be taken from the last picking or immature bolls. The cotton picked for seed should be stored and ginned separately and the seed used to plant the next year's crop. By using this same method from year to year the farmer may maintain or improve the purity and excellence of any good variety of cotton.

PLANT-TO-ROW METHOD OF SELECTION AND BREEDING

Selecting the Breeding Plat

The breeding plat should be located on land of the same nature and degree of fertility as the soil on which the seed produced in the breeding plat is to be planted. By locating the seed plat on soil similar to that in the neighborhood the strain of cotton from year to year becomes adapted to the soil of that nature.

It is essential that the soil or plats be uniform and the various rows be given the same opportunity in every respect. Dead furrows and back furrows should be avoided. In order to prevent this the rows should be planted at right angles to them, otherwise the rows close to dead furrows might be placed at a disadvantage and those close to the back furrow might have the advantage. If one side of the breeding plat is higher than the other, the rows should be planted so that each one will have an equal amount of high and low land. These points are exceedingly important, for unless the rows have an equal chance the results of the test will be unreliable.

In cotton breeding work, isolation is essential. The breeding plat should be separated from other cotton as far as possible, for, while cotton is a self-pollinating plant, yet insects cross-pollinate a considerable portion of it.

The size of the breeding plat can be suited to the size of the farm and labor available for the work. A plat containing fifty rows 250 to 500 feet long, or 100 rows 250 to 500 feet long, is a very convenient size.

Method of Selecting and Breeding

First Year.—To begin with, the farmer should secure good seed that has been grown under as nearly his local conditions as possible. Selections should be made from the crop grown from this seed. Begin in the fall by selecting fifty or more of the best plants as follows: Before the first picking, go through the field and select plants conforming more nearly to the type you have in mind and mark each selected plant with a tag or cloth, and caution the picker against picking them with the general crop. When most of the bolls are open, make a second visit to the field and eliminate all plants that show undesirable characters. Pick the cotton from each marked plant and place in a separate bag and give each bag a number. Pick only well opened bolls from the center of the plant. All the bolls from the top of the plant and at the ends of the limbs, even though well open, should be rejected. The chances are that they are not mature cotton. Then cotton from each plant may be ginned separately on a small gin, if available, or the seed may be planted with the lint attached.

Second Year.—Use the same precautions in selecting the breeding plat as in the first year. Plant the seed of each plant in a separate row with the number to correspond with the number of the plant. Plant five or more seed to the hill, making the hills the same distance apart in the rows. The breeding plats should be cultivated and treated the same in every respect as the general crop. Just as the selections begin to bloom, examine each row and make note of those having the best stand and the most uniform lot of plants, and that have the most desirable qualities. At this time a

number of the desirable plants may be spotted. Mixtures due to previous crossing are also apparent at this time. The undesirable plant should be removed to prevent crossing with other plants. Crossing would defeat the very object for which selections were made. At the time of maturity inspect the rows and note the relative yield, earliness, freedom from disease, uniformity and the desirable plant characteristics as described under "Type of Plant to Select For". When most of the bolls are open select the best plants in the good rows for seed to plant next year's plant-to-row plat. Keep the seed from each selected plant in a separate bag and give it the same number as the rows from which they came. For example, each of the plants from row No. 1 would be numbered No. 1. These selected plants are kept for plant-to-row tests next year. Bag the cotton from each row separately and make accurate weights. Do not depend on general observation, for such methods are inaccurate and too often misleading. Determine the length and strength of the lint and linting percent of the cotton in each bag. After the relative yields of the rows have been determined, the seed from the best rows may be thrown together and used to plant next year's general crop.

Third Year.—Use the same precautions in selecting the breeding plat as for the second year. Plant the seed from each of the plants in separate rows as before. Some of the rows should show considerable advance in uniformity and desirable characters over those of the previous years. As soon as the first blooms begin to appear, pull out all undesirable plants to prevent crossing with selected plants. At harvest time make careful examination of each series of rows, considering all of the rows having the same number as belonged to the same series. Choose the best series and save seed from all the good plants of the series. For example, if the rows marked 10 are uniform and show desirable characters, seed should be saved from all the good plants of the series. The seed cotton from these plants may be put together and ginned. The seed from this lot should be sufficient to plant what is called the increase plat. The increase plat should be planted each year.

Before picking the chosen series, select out enough of the best plants to plant your plant-to-the-row breeding plat next year. This should be done each year, and use the seed from your increase plats for growing next year's general crop.

Protection against the danger of crossing between the rows in the plant-to-the-row plat can be secured by holding over a part of the seed of the selected plants used to plant the plant-to-the-row plat, the remainder of the seed that produced the best row can be planted in an isolated breeding plat in the year following the plant-to-the-row test. In this way a special strain may be developed from a single plant.

Storing and Ginning the Seed Cotton

When the cotton is picked from the increase plat it should be stored in a dry house away from the other cotton so it will not mix, and it would be well not to have the seed cotton ginned until the cotton picking season is over and all the cotton in the community has been ginned. Then, when the seed cotton is carried to the gin, go with it and see that the gin is well cleaned before ginning the seed cotton, and in that way the seed will not become mixed with the other cottonseed at the gin. The seed should be stored in a dry house away from other cottonseed so that there will be no danger of mixing.