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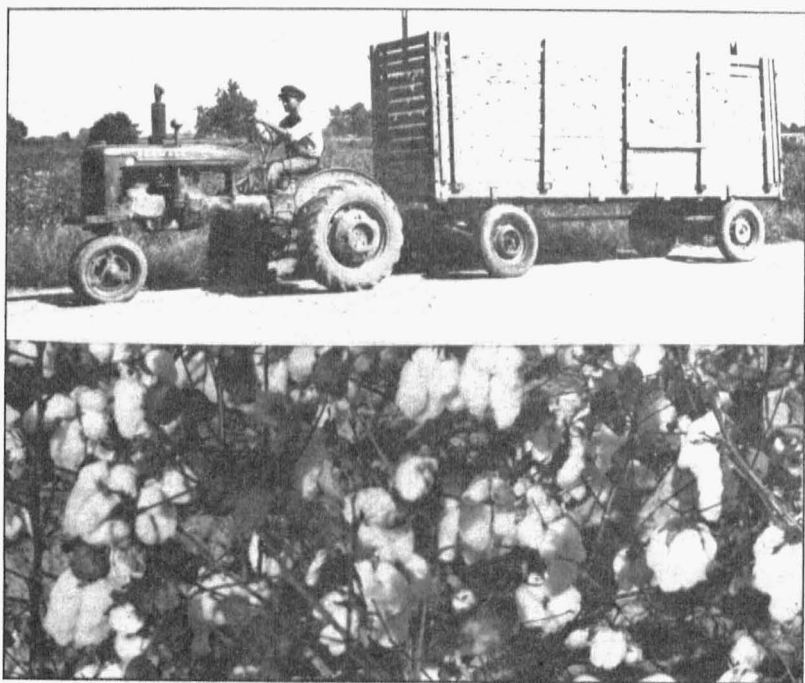
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GOOD VARIETIES OF COTTON FOR MISSOURI

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Cotton can be no better than the variety planted.

Variety is the most important consideration under the cotton grower's immediate control in producing a crop.

For the variety practically controls the staple length of the crop. It influences the yield greatly and bears distinctly on the grade. Moreover, buyers increasingly are becoming variety conscious since

*Revision of Circular 206 by B. M. King.

there clearly is a relation between variety and the spinning properties of the lint. These amount to a substantial reward for making the right choice of variety. The old adage takes on new meaning: "Once the grocer puts his planter away in the spring he has gone a long way toward setting the worth of the crop."

To aid growers in making the best choice, cotton variety tests have been conducted in southeast Missouri for many years. This work lately has been centered at the experiment field near Sikeston on a moderately productive phase of Lintonia silt loam soil. And tests have been made on different soils in other sections of the area to determine which varieties best meet Missouri cotton growers' needs.

Now that cotton production in Missouri is practically on a one-variety basis, the grower makes no mistake in simply adopting the variety that is dominant in his community. Besides the relative assurance that this is the best variety for his conditions, he enjoys other advantages. Among these he will find good seed of that variety easier to get and cheaper than other seed of similar quality. The market for his lint cotton is usually better because buyers are more interested in communities that offer large lots of "even running" cotton.

Deltapine

The variety Deltapine, better known to many Missouri growers progressively as D. & P. L. 11, D. & P. L. 11A, D. & P. L. 12, 14 and now 15, originated as a plant selection from a cross between an unnamed non-commercial hybrid and D. & P. L. 10.

Deltapine has ranked among the highest yielding varieties in nearly all of our variety tests. The medium-large open-type plant growth is a desirable feature from the standpoint of its usefulness under a wide range of soil conditions. It is vigorous enough to produce a comparatively good growth on rather poor land, but seldom grows too rank except on very fertile land heavily charged with nitrogen and organic matter.

An unusual and particularly attractive feature of Deltapine is the combination of good staple length and high lint percentage. Growers have reported gin turnouts ranging as high as 40 per cent. The average turnout in our tests approximates 38.9 per cent. The staple is good quality and ranges from 1-1/32 to 1-3/32 inches in length, depending mainly, it seems, on the fertility of the land and the supply of soil moisture during the time of boll development. The bolls are medium size (averaging about 75 or 80 to the pound of seed cotton), hold the open cotton reasonably well over a long period and during adverse weather, and are easily picked.

Stoneville 2-B and 2-C

These strains of Stoneville are descendants of Stoneville 2 which was developed from Lone Star 65. Their performance in Missouri has been so similar that they are referred to jointly as Stoneville.

Stoneville produces a medium-sized spreading type of plant with a comparatively light foliage. The bolls are medium large, averaging about 70 per pound of seed cotton, open well and are easily picked. The staple is good quality and ranges from 1-1/16 to 1-1/8 inches in length depending on environmental conditions. It is a full 1/32 of an inch longer than other Stoneville strains formerly grown in Missouri. The lint percentage ranges from about 34 to 37 per cent with an average of 35.1 per cent in our tests. It matures early and the bolls are open for picking at approximately the same time as Deltapine.

With but a few exceptions, Stoneville ranked among the best varieties in acre yield and money value per acre in each test and its average performance was unsurpassed. The full range of adaptation of this variety to the various soil types and fertility levels cannot be stated, but certainly it is very broad. Deltapine also is widely adapted. And for nearly all soils of intermediate fertility levels there is little to choose between these two varieties, except on the basis of small differences in boll size, lint percentage, staple length, and picking qualities.

Deltapine, because of a more vigorous plant growth, probably should be given preference over Stoneville on poor land; but Stoneville, with a less vigorous plant growth, should be given preference over Deltapine on rich land where cotton grows too rank. !

Rowden

Rowden is the most generally used of the several wilt-resistant varieties. Even so, the acreage would account for only about five per cent of the state crop. Its use is recommended only in those localities where fusarium wilt is so prevalent that Deltapine and Stoneville, both susceptible varieties, do not reach their usual standards.

Many strains of Rowden have been developed. The most popular in Missouri such as Rowden 41 are characterized by a large boll, staple length usually of about a "flat" inch, and gin turnout of 33 to 35 per cent.

Deterioration of Cotton Varieties

Experienced growers recognize that superior varieties deteriorate in yield, uniformity of lint, and other essential features of a good variety. But the rapidity with which this "running-out" process occurs and the reasons for it are not always fully appreciated. Grow-

ing a number of varieties in the same community and ginning the crops at custom gins are the principal causes. These practices cause the seed of a variety to be mixed not only with the seed of other varieties but with degenerated stocks of "gin-run" seed.

The amount of mixing that takes place in the gin is surprisingly large, where different varieties follow each other in single bale lots through modern machinery. Experiments by Ballard and Doyle* show that more than 25 per cent mixing may occur. Also these experiments show that even if varieties are ginned in lots of several bales mixing will occur, but in successively smaller amounts up to the ginning of the fourth bale. And mixing will occur even in later bales if the seed is allowed to pass through screw conveyors.

Although gin mixing is the principal cause of deterioration of cotton varieties it is by no means the only cause. Cotton varieties are cross-fertilized readily by pollen transferred by natural agencies from flowers of one variety to those of another. Because of the sticky nature of cotton pollen it is not blown about by the wind like corn pollen but is carried from one flower to another by bees and other insects. Crossing takes place freely between varieties in the same field where gin mixed seed is planted, or where two varieties are grown near each other. The amount of crossing depends on the number and kinds of insects present, the distance between varieties, and to a smaller degree, on other factors such as the relative time the two kinds bloom. Where two varieties are grown in adjacent fields or in the same fields, anywhere from five to ten per cent of crossing is likely to take place in the first few rows of each. With an increasing distance between the two kinds the percentage diminishes. Some crossing may take place between varieties separated by a distance of 200 yards or more but the percentage is small.

After a superior variety has been subjected to gin mixing and crossing with other varieties for a few years, it becomes so badly mongrelized that it shows little resemblance to its former type. The yield is lower. The staple is inferior in quality. As a result of crossing, many hybrid plants are present some of which are decidedly inferior to the parent varieties. They present a wide range in height, time of maturity, productivity, general growth habits, leafiness, boll size and shape. "Slick-seeded" plants often appear and they are the unmistakable and frequently the first indication to the farmer that his variety is running out.

Even if all gin mixing and cross pollination are prevented a variety will eventually deteriorate as the result of the appearance of worthless

*Ballard, W. W. and Doyle, C.B., Cotton Seed Mixing Increased by Modern Gin Equipment, U. S. Department of Agriculture, Department Circular 205, 1922.

off-type plants from time to time. However the rate at which a variety deteriorates through this natural tendency to "go to pieces" is comparatively slow. By roguing out these faulty plants as soon as they appear a uniform variety can be maintained almost indefinitely at high productivity. But this cannot be done efficiently except by someone who is trained for this work.

Keeping a Cotton Variety Pure

Gin mixing and cross pollination are major causes of deterioration of cotton varieties. For this reason, measures should be employed to correct the practices in cotton growing and handling that permit these degrading influences. Cross pollination can be prevented simply by growing a pure variety in an isolated field. Or, where isolation is not possible, that part of the crop most favorably located for crossing can be discarded as a source of planting seed. The control of gin mixing, however, is not so simple and requires considerable effort by the grower and the cooperation of the ginner.

In handling the crop from a pure seed increase field a number of special precautions must be taken to prevent seed mixing by the gin and by other mechanical means if more than one variety is produced on the same farm. Also, precautions are necessary to insure proper seed germination. The chief precautions are:

(1) All picking sacks, wagons, cotton houses, or other containers used to harvest and store the crop should be thoroughly cleaned before picking begins.

(2) The crop should be picked over as often as necessary to insure that the seed will not be unduly exposed to loss by storms, or lowered germination by weathering.

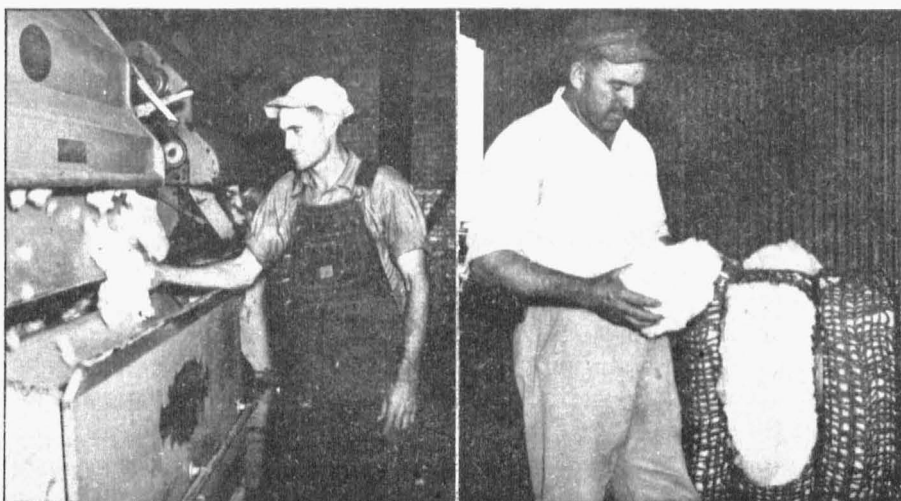
(3) Before the crop is ginned, the seed roll should be dumped. All gin parts where mixing may occur, including the suction pipe, overhead cleaner, gin stands, distributor belt, and seed conveyor should be thoroughly cleaned. A screw conveyor is difficult to clean; and unless a gin is equipped with the belt type, now called a "clean seed system", it is best to allow the seed to fall on the floor in front of the stands after it has been swept clean of stray seed, dirt and trash.

(4) The seed should then, be sacked in even weight bags and properly labeled. Seven- or eight-ounce burlap bags that will hold 100 pounds of cotton seed is a convenient size, and the open weave permits the seed to dry. They should be stored in dry, well ventilated buildings by stacking so as to permit air to circulate freely between.

To prevent heating and loss of germination while in storage, additional precautions may be needed when handling seed from cotton harvested early, or shortly after rain.

Considerable time is required to clean a gin and operators are justly reluctant to stop their machinery on busy days long enough for a thorough job of cleaning. For this reason it is best for the ginner, and farmer as well, to postpone ginning the good variety until the gin is idle. Slack periods occur after rains or toward the end of the picking season that can be used to advantage for saving pure seed. In the meantime, storage must be provided for the seed cotton, preferably in a separate cotton seed house; or a special bin may be used provided there will be no mixing with other seed cotton stored in nearby bins.

Despite these safeguards for maintaining pure seed, in many cases it has not yet been done effectively. The best procedure for farmers who want to keep seed pure is to unite in growing only one variety, and use a cooperating gin that handles this variety exclusively. This one-variety plan is by no means new, but long has been advocated by Cook and his co-workers in the United States Department of Agriculture, and by state experiment stations.



The grower's job is not finished until the cotton is carefully ginned and sold on a grade and staple basis. The grower who neglects these final steps stands to lose.

The outstanding advantage of the one-variety plan is that year after year it provides an easy means of higher production and better quality lint, through the use of good seed available at the lowest cost. But there are other advantages. Communities with a reputation for producing high quality seed can often dispose of their surplus to

unorganized growers at a premium over oil mill prices. Also, there is a price advantage gained from the sale of large quantities of good uniform fiber not possible in mixed variety communities.

The type of organization required for successful operation of a one-variety production program will vary from one community to another. But there are certain fundamental points on which there should be definite understanding and agreement in all cases:

(1) A variety acceptable to all the growers must be chosen. Present information indicates there is no question that the choice might well be limited to Stoneville and Deltapine, or in areas of serious wilt, Rowden. The relative adaptation of these varieties to various soil fertility levels, relative earliness, boll size, plant type, staple length, etc., afford a sound basis for selecting one of them for growing on a community basis.

(2) Pure seed stocks must be made available to the growers. The cost of a sufficient quantity of pure seed direct from the breeder for planting the entire acreage of all cooperative growers the first year might be prohibitive. It would then be necessary for each member to produce enough seed of the chosen variety in an isolated field for his entire acreage the next year. A still better plan would be for a few growers (preferably one or two) to produce the required amount of pure seed for sale to the others at a price agreed on in advance. Thereafter, each grower could save seed from his own crop until it seemed necessary to bring in another stock of seed, either of the same or a different variety. It would again be advisable for a few growers to produce enough seed for the whole community the next year.

(3) Arrangements must be made for ginning the crops on a gin that excludes all other varieties. A guarantee by the growers to deliver enough cotton for a capacity run during the peak of the ginning season, and a return guarantee by the ginner to exclude all other varieties, would appear to be an attractive arrangement for both. Separate ginning to prevent mechanical mixing of seed, and careful isolation to prevent crossing, will keep a variety pure and productive.

Other Factors in Producing Good Cotton Crops

There is no other production factor so important and so easily applied on every cotton farm as that of **using good seed of a good variety**. Yet there are additional factors in producing profitable crops, and the neglect of one will lessen the effectiveness of the other. Among these are:

1. Keep the soil productive by growing legumes and returning at least a part of these crops to the land in the form of animal or green manure, together with the proper use of fertilizers.

2. Put the land in good condition for the crop by thorough seed-bed preparation.

3. Plant as soon as temperature conditions are favorable for prompt germination. Usually this is about the first of May, though in some seasons excellent results are obtained from earlier plantings.

4. Plant seed high in germination to insure enough plants for thinning to a uniform stand.

5. Careful and thorough cultivation, especially during the early growth stages of the crop, that will conserve the stand and control weeds and grass. Cultivating deeper or more often than necessary for complete control of weeds may, particularly in the case of deep, late cultivation, cause a reduction in yield.

6. Pick the cotton soon after the bolls are open. This can be done only by making certain well in advance that the required labor will be available when needed. Growers who depend mainly on transient-pickers may suffer unnecessary crop losses both in quality and quantity.