Cotton Growing in Illinois

By J. A. Evans, J. C. Hackleman, and F. C. Bauer

Field Showing Ridges Before Leveling for Cotton Planting

Cotton growers on the northern limit of cotton production and those in the boll weevil section have the common problem of maturing in the shortest time possible the greatest amount of cotton. With each it is a race—in the one case against an early frost and in the other against the boll weevil. The grower under severe boll weevil conditions has found that he can win the race by planting only on fertile, well drained soils, by using good seed of early maturing varieties, by spacing thickly, and by cultivating frequently, all of which hasten the fruiting and maturing of cotton. There is every reason to believe that these same practices will be the most profitable to follow in southern Illinois by the farmers who may wish to attempt raising cotton.
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Cotton growing is a new enterprise in Illinois. While cotton was used in Massac county from 1911 to 1921 in the rotations on the University soil experiment field, it had not been grown in commercial quantities since before the Civil War until 1922. More than 1,000 acres planted in 1923 in the five southernmost counties produced an average crop of about 250 pounds of lint (one-half bale) an acre. At prevailing prices this was perhaps the best paying crop ever grown on these lands. The results have aroused great interest in cotton growing in these and adjoining counties. It is not unlikely that twenty or thirty thousand acres, perhaps more, will be planted to cotton in this area in 1924. Since cotton has not been considered a staple crop for this section until recently, very few experimental data have been secured in southern Illinois on varieties, cultural methods, the use of fertilizers, rotations, etc., which would serve as a safe guide for prospective growers. The venture is one with many hazards, particularly for one unfamiliar with the crop. This circular is issued to answer the questions that inexperienced growers will naturally ask, and the authors have tried to include in it the best information available that is thought to apply to conditions in southern Illinois.

What are the best weather conditions for cotton growing? An ideal cotton season is one having five or six months of rather uniformly hot weather, with moderate but well distributed rainfall. Cotton does not require so much moisture as corn, in fact it is almost a semi-arid plant, thriving best in a hot, fairly dry season. At least 200 frostless days are considered necessary for a successful crop and an average temperature of 77 degrees during the growing season.

In recent years earlier maturing varieties of cotton have been bred and cultural practices have been developed which tend to hasten fruiting and maturing of cotton. It is these factors, and not any change in seasons, which are making it possible to grow cotton profitably somewhat farther north than heretofore thought possible.

Where may cotton be grown in Illinois? Cotton may be grown with reasonable safety only in the five or six counties in the extreme southernmost part of the state, where it is now grown. In favorable years it might also mature well in a few counties next to these, which have an average frostless season of 190 days, but there would be more

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danger of loss thru short seasons and early frost than in the southernmost counties. In both these areas low temperatures in May, June, and September are the greatest risk in cotton growing. There are occasional years when a cold, wet spring, which would delay planting and retard the early growth of cotton, is followed in the fall by an early, killing frost. In such a season cotton might be severely damaged by frost and the whole crop lost, a risk which one should consider when deciding how extensively to plant cotton.

**What yields may be expected in Illinois?** In normal seasons yields of one-half to about one bale of cotton per acre may be expected in Illinois where good seed is used on fertile soil and good cultivation is practiced. Two plots of cotton on the University soil fertility field in Massac county, Illinois, have yielded about one-third of a bale an acre as an average of ten crops. Three of these crops were practically failures. Unless an average of one-third of a bale or more to the acre can be grown, cotton will hardly prove a permanently profitable crop in Illinois.

**What are the advantages and disadvantages of cotton farming?**

A good profit may be had from cotton at the prices prevailing, provided one can produce one-third of a bale or more per acre. One of the great advantages of cotton is that it is a staple crop which can be held indefinitely without damage, if kept dry, and can be sold for cash at any time. Altho it requires attention over a long period, it is a fairly easy crop to grow, and one for which cheap labor, if available, can be used at critical periods. Its chief disadvantage is that it requires considerable labor, particularly at chopping and picking time, and, in recent years at least, such labor has been increasingly expensive and sometimes hard to get if not available in the grower's own family. Moreover, the need for labor comes at the same periods when corn, alfalfa, and other standard crops are using labor. The possibility of severe loss from frost damage in occasional years is also a disadvantage in southern Illinois which must not be overlooked.

**How much cotton can a farmer plant and care for?** No one should plant more cotton than he is certain to have labor to care for properly. Probably ten acres or less is all that a beginner should undertake. The extra labor needed later in the season not only may be so high as to cut down profits unduly, but may not be available, so that the crop will suffer for lack of proper care. It should be remembered that much more can be planted and cultivated than can be hoed, chopped, and picked by the same labor, and that this labor will be needed over a long period of time when other crops may also be needing attention. Also, there is no certainty that some year the cotton crop will not be damaged by early frost. Should this happen, the grower who has but little invested would not suffer irreparable loss, but one who has planted extensively might be financially ruined.
What is the best variety to plant? Since the different varieties of cotton have not been thoroughly tested under southern Illinois conditions, it will be safer to plant only the earliest maturing varieties. In the order named, these are probably Trice, King, and Half-and-Half, of the short-staple varieties, and Express, of the longer staple varieties. Trice cotton has for five years led all varieties in total yield at the Virginia Experiment Station. It is also one of the leading varieties at the Tennessee Station. Half-and-Half is a heavy yielding and early maturing cotton which is popular with farmers in Tennessee and some other parts of the country, but it is not recommended by experiment stations because of inferior staple. Express matures as early as any of the other varieties, and is best adapted to a very rich soil. Acala, Wanamaker-Cleveland, Delfos, Triumph, and Rowden are all fairly early, big-bolled, high-yielding cottons and have better lint qualities than the first varieties named. Whether they are as safe to grow under Illinois conditions as the first varieties named is still a little doubtful.

What soils are best for cotton growing? Only fertile, well-drained loam soils which warm up quickly, should be planted to cotton in Illinois. Cold, gumbo soils are unsuitable. As stated, it is a race with frost; and a good start helps to win any race. A cold, wet spring, which will hinder the quick germination and vigorous growth of young cotton plants, is probably the most serious handicap which Illinois growers will encounter. If loss occurs from early fall frost, it will usually be due, not so much to the fact that the frost came unduly early, as that the cotton was slow in starting because of being planted under unfavorable conditions or because of a cold, wet May and June. A south and east slope should be used if possible in order that the plants may have all possible advantage of the early sun.

What soil treatment is best for cotton? There is but little definite information regarding the soil requirements for cotton in southern Illinois. However, since success depends almost entirely on rapid growth and early maturity it seems clear that only fertile and productive soils should be used. If the crop is to be grown for some years, the best results will probably be obtained when it is grown in suitable rotations with legumes. The legumes may be expected to furnish the soil with the fresh organic matter it needs and perhaps all of the nitrogen required. Mineral elements may also need to be supplied, tho the most profitable forms and amounts have not yet been determined. At the Unionville experiment field in Massac county profitable results were obtained with manure, limestone, and potash during the ten years cotton was grown in a rotation of corn, cowpeas, wheat, and cotton. Sweet clover was seeded on certain plots in the wheat and turned under as green manure for cotton.
As an emergency measure in growing cotton the coming season on none too fertile soils, the use of readily available fertilizers may be advisable. Altho the results that are likely to be obtained from their use in Illinois are largely speculative, the expense for them may be justified because of the present high selling value of cotton. On soils that are fairly well supplied with organic matter and in a fair state of fertility, the use of 300 to 400 pounds of “16 percent” acid phosphate is suggested. On less productive soils the use of 100 to 200 pounds of either sodium nitrate or ammonium sulfate in addition to the acid phosphate, and perhaps also 50 to 100 pounds of either muriate or sulfate of potash, may be found profitable. If more than one of these materials are used, they should be mixed together thoroughly before being applied to the soil. They should also be thoroughly mixed with the soil before the seed is planted. This may be done by distributing the mixture on the land after it has been plowed and bedded, and following with a planter which has an attachment in front of the seed box for mixing the fertilizer with the soil.

If the farmers of southern Illinois are to continue to grow cotton, they should plan to get a suitable rotation under way as soon as possible. A rotation of corn, cotton, cowpeas, and wheat, with a seeding of sweet clover to be plowed under as a green manure for corn the following spring, will probably be satisfactory. Limestone should be used in connection with such a rotation, and if farm manure is available it also should be utilized. After such a rotation is established, it may be possible to stop using part or all of the readily available fertilizers or perhaps to use in their place some of the less readily available fertilizers costing less.

How should the land be prepared for planting? Planting should never be done on freshly plowed or bedded ground. On soils where there is a heavy growth of some cover crop or a large amount of organic matter to be turned under, the land should be plowed in the fall or early winter, if possible, or at least six weeks to two months before planting. It should then be bedded about two weeks before planting. If the surface of the soil is practically free of organic matter, the soil may be prepared without previous plowing by simply throwing it into beds five or six inches high. These should be prepared at least ten days or two weeks before planting, if possible, so that they will become firm and well settled by the planting date.

The usual method of bedding is to lay off rows by running single furrows the distance apart which the beds are to be, usually 3 feet 6 inches. Each furrow is then thrown back on itself and the ridge formed by throwing two more furrows over it. The operation is completed by running out the middles with an ordinary turning plow or a lister, sometimes called a middle-burster. (See illustration on the cover page.) This may be done either when the bed is thrown up or after the cotton
has been planted. Just before planting, the tops of the beds should be dragged or harrowed off an inch or more, in order to get a clean, smooth planting surface.

If cotton is to follow corn, the stalks should first be raked and burned, for if plowed under they will seriously interfere with cultivation and may cause a broken stand of cotton.

**Why should cotton be planted on a ridge?** By ridging or bedding the soil, more surface is exposed to the sun, so that the seed bed dries out more quickly and warms up earlier than it would if made on a level surface. This insures earlier germination of the cotton, especially if the spring should be wet and cool.

**What is the best time to plant?** No uniform planting date for cotton can be given. The rule is to plant as soon as danger from frost and cold is past and the soil is warm enough to insure prompt germination and vigorous early growth. Usually this will be two or three weeks after the last killing frost. May 15 to 25, depending on the season, ordinarily will be about the right time for planting cotton in southern Illinois. Nothing is to be gained by putting cotton seed in the ground before conditions are right; to do so will often result in failure to secure a stand and the delay and expense of replanting.

**How is cotton planted?** Cotton planting is done with a specially constructed planter, which is run down the middle of the beds. Plenty of seed should be used to insure a full stand. A bushel to the acre is commonly used, but a bushel and a half or even two bushels is not too much. The seeds should be barely covered; it will do no harm if they show here and there in the row. *Planting too deep is one of the most common causes of poor stands.*

Cotton seed rolled in nitrate of soda or delinted by the sulfuric-acid process germinates quicker and grows better under unfavorable seasonal conditions than untreated seed.

**What spacing is best for cotton?** As soon as the cotton plants are fully up and probable danger from cold is past, the plants should be chopped, or thinned, to leave two to three plants in a place and the groups of plants eight to twelve inches apart. This comparatively thick spacing tends to suppress the vegetative branches (branches that do not bear bolls) and forces early fruiting and maturing, and at the same time allows a free hoeing out of the weeds and grass. At nearly every experiment station where cotton has been grown under experimental conditions and thorough weeding by hand has been possible, the un-thinned plots have made the highest yield, but under farm conditions, where labor is limited, some thinning must be practiced in order that the cotton row may be more easily kept free from weeds and grass.

**How is the crop cultivated?** Cultivation preferably should begin soon after the cotton is planted and before it is up. This first cultiva-
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After thinning, and also the second and the third, can best be given with a section harrow or weeder. If the teeth of the harrow are slanted backward slightly, the harrow may be run diagonally over the field and the young weeds and grass killed very effectively without materially injuring the cotton. Side harrows also are commonly used for cultivating the very small cotton before it is chopped out. As with corn, the principal object in cultivating is to keep the crop free from weeds and grass, and, in dry weather, to conserve moisture.

As soon as the crop is thinned, it should be cultivated with small shovels or sweeps, which throw a little soil to the plants; and from this time on, it should be given a shallow cultivation every week or ten days. Small shovels, sweeps, or a spring-tooth attachment to cultivators can be used; in fact, any implement which will give shallow cultivation and keep the field free from weeds and grass will be satisfactory. Cultivation should be kept up usually until about August 1, but it may be discontinued earlier if the cotton is growing vigorously and the field is free from weeds and grass. Very late cultivation has some tendency to delay maturity.

**Pure-bred seed far outyields common.** Pure-bred seed, the high-producing qualities of which have been kept up by selection from year to year, will greatly outyield mixed, oil mill, or gin-run seed under similar conditions, and will usually repay the additional cost many times over the first year. The North Carolina Experiment Station found that improved strains of cotton yielded from $5 to $60 an acre more than the best unimproved varieties grown in the same communi-
ties. The average increase from improved strains, in several hundred tests made over a period of five years, was $28.97 an acre.

After a good strain of cotton has been obtained it should be kept pure and productive. This can be done by taking seed from the most productive plants and planting it in a seed-breeding patch, from which the choicest seed will again be selected for the breeding patch of the next year. Extreme care should be used in the picking and ginning of the seed from the breeding patch in order to maintain purity and high quality.

**The boll weevil not likely to be a serious pest.** This insect is apparently now near the northern limit of the range where it can live thru the winter, and is still some miles south of the extreme southern point of Illinois. It may migrate northward into Illinois during the growing season, but injury from these migrating weevils is not likely to be serious. There is very little, if any, chance of injury by this insect the coming season.

**Other insects may cause some losses.** The cotton boll worm, or corn ear worm, will cause some losses to cotton in southern Illinois as it is always present in this area. The loss from this insect is not likely to be so heavy as it is farther south. Some benefit has resulted from the use of calcium arsenate dust. Frequent cultivation helps to reduce the damage by this insect.

Cutworms will cause injury during some seasons, but they will be no more destructive to cotton than they now are to corn. They can be controlled by the use of the poison bran bait.

The cotton leaf worm, or cotton worm, is fairly abundant in Illinois every year, but probably never passes the winter in this state. The moths make their appearance about the first of September, flying up from the cotton fields of the South. The worms will usually start feeding on the cotton from September 1 to 15, and will continue feeding up to the time of frost.

In seasons when these worms are abundant, it will be necessary to dust the cotton with calcium arsenate at the rate of eight to ten pounds per acre in order to control this insect. The dust may be applied with a blower duster or by means of a bag shaker on each end of a pole carried by a man on horseback.

No other insects are likely to be of special importance on cotton in this state during the next few seasons.

**NOTE.—** It is not expected that any cotton disease will prove serious in southern Illinois during the next few years tho some may be troublesome in a minor degree. For information concerning cotton diseases, address the Agricultural Experiment Station, Urbana, Illinois.

Information on insect pests is contributed by W. P. Flint, State Entomologist, Illinois Natural History Survey.