MORE HEMP must be grown in the United States in 1943 to fill an urgent war need. The war in the Pacific has cut off nearly all the supply of strong fibers previously imported from that area; but hemp, an annual plant adapted to the corn belt, produces good yields of a highly desirable fiber. This fiber is found in the thin outer bark of the stem. It will be used largely to make marine rope, cordage, and thread.

Several mills for extracting the fiber will be constructed in northern Illinois by the Government. Each mill will process the hemp from about 4,000 acres. Since the straw must be transported to the mill, all hemp should be grown within about 12 miles of a plant. Growers will sign a contract to sell their straw to the Commodity Credit Corporation, and will purchase approved seed and rent special machines for cutting and for binding from Commodity Credit.

Previous experience with hemp in the corn belt indicates that it should be considered primarily as a war crop needed to meet an emergency. Its importance after the war cannot now be predicted, tho research on new uses for high-quality fiber may make limited production profitable then.
Hemp Requires Rich Soil

Soil on which hemp is grown must be well supplied with organic matter and nitrogen if the plants are to yield a uniform and dense stand of tall slender stalks. A soil capable of producing 75 to 80 bushels of hybrid corn an acre under favorable growing conditions is capable of producing profitable hemp crops of two and one-half to three tons an acre.

Hemp grows best on soils that are undulating to gently rolling, drain readily but are not drouthy, do not crust easily, have no low or "soggy" spots, and have enough limestone, phosphorus and potash to grow an excellent crop of clover. Among the Illinois soils that seem to meet these requirements are the Muscatine, Brenton, Saybrook, and

This poor growth of hemp was on land which was in corn the three preceding years and lacked the organic matter and nitrogen necessary for profitable hemp production.

NOTE. Altho hemp has been grown experimentally by the Illinois Agricultural Experiment Station for more than twenty years, it has not been planted extensively by Illinois farmers. Commercial production in the United States has been confined largely to Wisconsin and Kentucky during recent years.

In preparing this circular the authors used helpful information and suggestions from A. H. Wright of the University of Wisconsin, Ralph Kenney of the University of Kentucky, and representatives of the U. S. Department of Agriculture. For the pictures on pages 2 and 3 the authors are indebted to H. G. Abbott, Fulton, Illinois, and for that on page 6 to the U. S. Department of Agriculture.
Sable silt loams, the well-drained Drummer clay loams, and the more level and more fertile phases of the Miami silt loams. These soils will usually grow a satisfactory crop without special fertilization, particularly if the hemp follows clover or alfalfa or a corn crop planted on clover or alfalfa sod. Any soil, however, which has the characteristics described above and which has been limed and phosphated and grown a good clover or alfalfa crop in recent years should be satisfactory.

Manure is one of the best fertilizers for hemp. When turned under for corn a year before hemp is grown, manure gives excellent results. If applied just ahead of hemp, it needs to be thoroughly and evenly distributed over the land, or an uneven growth will result. On fall-plowed land, manure may be spread during the winter and worked in during seedbed preparation in the spring.

Hemp is very responsive to liberal amounts of nitrogen, phosphorus, and potash. Applications of 150 to 200 pounds of a mixed fertilizer drilled with the seed, or 250 pounds if broadcast, produce straw which is more uniform and weighs out heavier. The exact formula to use depends upon the balance of the fertility elements in the soil and the fertilizers available. In the main a 0-12-12, 0-10-20, or 3-12-12 fertilizer is recommended. Commercial fertilizer applied in direct contact with the seeds will not injure them unless applied at rates considerably heavier than those mentioned.

This hemp was on land which was in red clover the preceding year. It grew only a short distance away from that shown on the opposite page and on a very similar type of soil.
Hemp is often thought to be hard on the soil because it grows 6 to 10 feet tall on good soil and is very dense. Experienced hemp producers, however, do not seem concerned about the fertility used. They feel that hemp helps control weeds, especially annual weeds, and leaves the soil in excellent condition for succeeding crops. A good crop takes about as much fertility from the soil as a 75- to 80-bushel crop of corn.

Thoro Seedbed Preparation Is Essential

Since hemp cannot be cultivated after it is seeded, the seedbed must be especially well prepared. Several cultivations or harrowings before seeding will kill many weeds and give the young hemp plants a chance to get ahead of those that come up later.

Clean plowing is important. All plant refuse, such as straw or stalks, should be completely incorporated in the soil; otherwise it will be picked up and bound with the retted hemp straw.

A seedbed considered "just right" for alfalfa should be the goal of every hemp grower. On most Illinois soils well adapted to hemp, fall plowing is desirable. For an excellent seedbed the soil should be pulverized several inches deep and then firmed.

Seed Hemp Just Before Corn Planting

Probably the best time for Illinois farmers to seed hemp is after oats are seeded (but not before April 20) and just before corn is planted. Seeding at this time gives growers an opportunity to kill several crops of weeds by working the seedbed a number of times before planting.

Seeding Practices Affect Yield and Quality

The best yields of high-quality hemp are obtained when the plants are uniformly distributed and the stems are tall, unbranched, and about the size of a lead pencil.

Under Commodity Credit contracts growers will be allocated 5 pecks (55 pounds) of seed an acre. With this fixed amount a grower must make sure he is seeding at the specified rate and not too thick or too thin, for both extremes are objectionable. Illinois contract holders will be furnished an approved and adapted strain produced in Kentucky in 1942 under contract with Commodity Credit. Imported seed is not recommended—it matures earlier and yields less than the Kentucky seed.

Hemp seeds are about the size of wheat, altho more nearly round. They should not be covered more than an inch deep. Rolling the seedbed with a corrugated roller or cultipacker just ahead of the drill will help prevent too deep seeding.
Probably the best method of seeding is with a clover- or grass-seed drill in 4-inch rows, but few such drills are available. The next best method is to use a 6-, 7-, or 8-inch grain drill. On highly fertile soil a grower will probably get a higher yield of uniform straw by planting half the seed in one direction and the rest at right angles to the first, especially if he has to use an 8-inch drill.

Farmers who do not have a grain drill can get satisfactory results by broadcasting the seed if they are careful. In fact, on soils inclined to crust, broadcasting may give better results than drilling. The land should be rolled with a corrugated roller or a cultipacker just before seeding. Half the seed is then broadcast in one direction and the other half at right angles to the first in order to insure a more even distribution. Then it is covered lightly, either with a spike-tooth harrow with the teeth set at about a 45-degree angle, or with a corrugated roller or cultipacker. On soils subject to crusting badly, the harrow may be best.

**Leave Border Around Hemp Field**

It is advisable to seed at least a 20-foot belt of small grain, soybeans for hay, or canning peas around the margin of the field. These early crops will be off the land before the hemp is harvested, thus leaving room for the harvesting machinery to operate without running over any of the hemp crop.

**Don’t Expect Hemp to Kill All Weeds**

Hemp is sometimes referred to as a crop that will eradicate weeds. It is true that if once ahead of weeds, it will keep them in check during the growing season because of its tall dense growth; but every farmer knows that weed seeds remain in the soil more than one year and that such seeds will not be killed. Besides, perennial weeds like quack grass and Canada thistle will come up again from roots as well as from seeds.

Perennial weeds and some of the annual grasses may choke out hemp if they get ahead of it in the spring. If, however, these weeds are kept subdued with a duckfoot or similar field cultivator right up to the time the hemp is seeded, the crop should be able to compete with the weeds and give a satisfactory yield. Vigorous weeds like velvetweed (stampweed or butter print), horseweed, or curled dock, may have to be pulled or cut when they endanger the hemp.

Farmers frequently ask if hemp is likely to escape and become another weed. Since the crop is an annual and is harvested before seed is formed, there is not much danger of its becoming troublesome, especially since the crop will be grown on land used in a regular rotation.
No Serious Disease or Insect Hazards

While several diseases attack hemp in old established growing areas, the Illinois crop is expected to be relatively free of these hazards for the first few years. Cutworms, corn borers, grasshoppers, and mites attack the crop but are not expected to cause serious damage to Illinois hemp in 1943.

Hemp Resists Lodging, Is Damaged by Hail

Hemp is very resistant to lodging, and ordinary summer storms are not likely to cause the plants to go down. Severe hail storms, however, reduce the leaf surface, and wherever the hail stones strike the stems, the fibers are weakened, thus reducing their quality.

The crop is not drouth-resistant and needs frequent rains.

Special Cutting Machine Needed

Hemp is cut with a special machine which cuts the plants low and spreads them in a swath with the butts even and pointing toward the center of the field (see illustration on cover). Cutting is done when the male plants are shedding pollen. In the hemp-producing area of Illinois this will be during the last week of August or the first half of September. At this time most of the lower leaves will have fallen and the top leaves will have a yellowish cast.

Altho hemp stubble seems very stiff, experienced growers report

Testing retting. The dry stalks are broken by bending them. If the hemp is completely retted, the woody core will fall away from the fiber and the fiber will not break. If the hemp is under-retted the woody core adheres to the fiber. If over-retted, the fiber will break.
that rubber tires on tractors, trucks, and cars are ordinarily not harmed by driving over the harvested fields. Particularly is this true on fields that have been seeded uniformly and at the recommended rate. On such fields the stubble is not as strong as on thin seedings and so is less likely to injure tires.

**Leave Hemp in Swath Until Retted**

Hemp is left in the swath until the stalks are partly rotted. The rotting of the outer bark of the stem permits the fibers to be easily separated from the inner part of the stem. This rotting is known as *retting*. Warm moist weather and heavy dews hasten the process.

To produce the best fiber, the plants must be turned once in the swath so the stems which have been underneath will be exposed. This should be done as soon as the exposed plants in the upper layer are retted, usually two to three weeks after cutting, for over-retting lowers the quality of the fibers. An easy way to tell when retting is complete is to break the stem at several points within a length of two or three inches. If the inner, or pithy, part of the stem drops away cleanly from the bark or fiber, the retting is complete (*see opposite page*).
The swaths are turned by sliding a pole under the tops of the plants and turning them over so that the tops point in the other direction. Turning is started in the center of the field since the butts of the plants are pointing toward the center.

Handling Hemp After Retting

As soon as all stems are retted, the plants are ready to be taken from the swath and bound in bundles like small grain. A special type of binder picks them up, binds them, and throws the bundles directly behind the machine. To avoid running over the bundles the next time the machine comes around, a man rides a sled behind the binder and throws the bundles to one side.

At the time of binding, the bundles contain too much moisture to be stacked, so it is necessary to shock them and leave them in the shock until they are thoroughly dry. They are then hauled to the processing mill, where they are weighed, graded, and stacked by representatives of the Commodity Credit Corporation.

After retting is complete, this gather-binder picks up the stems from the swath and ties them in bundles. The bundles are then shocked so they can dry thoroughly before being stacked at the processing plant.