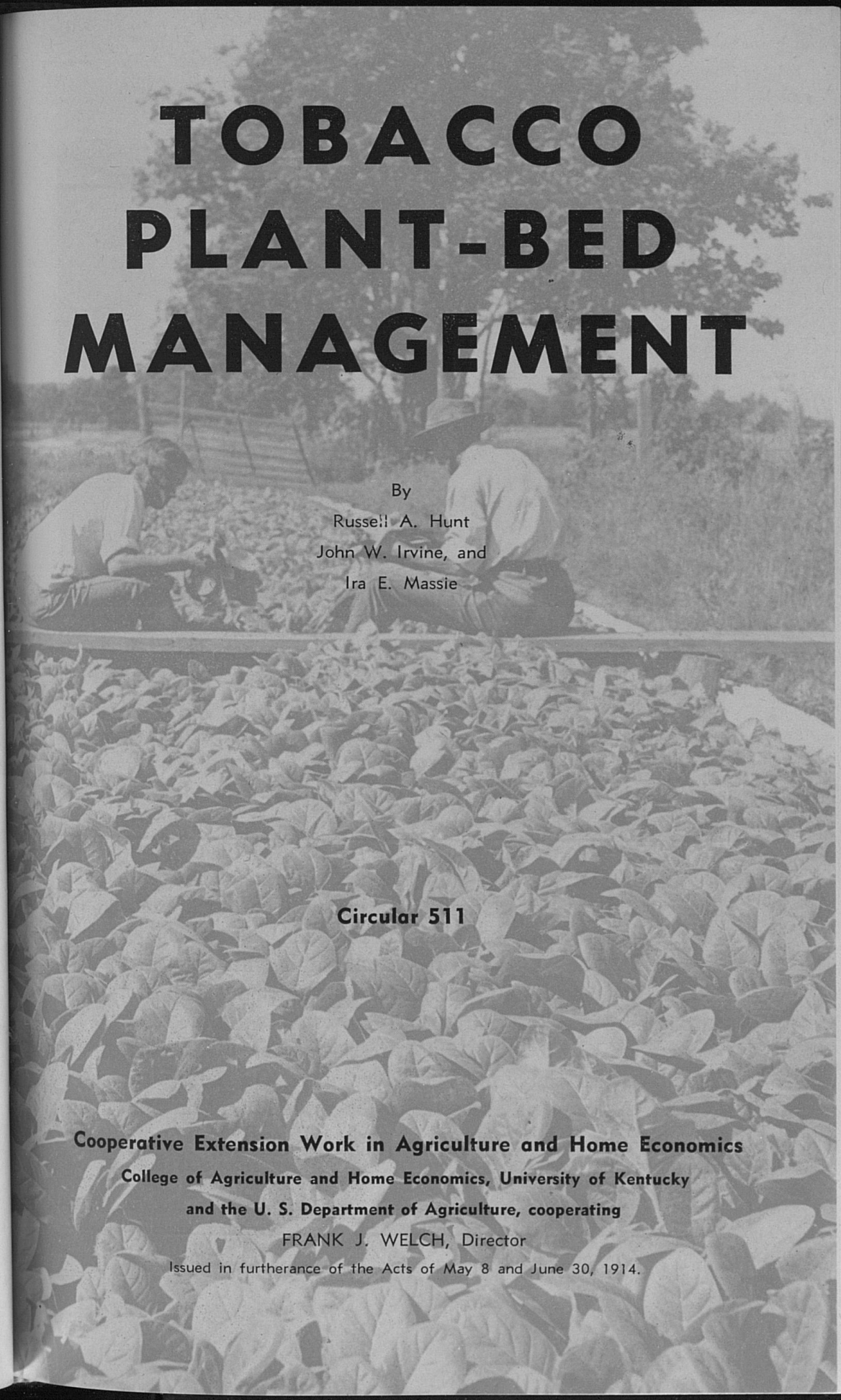

TOBACCO PLANT-BED MANAGEMENT

By
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Plan for a surplus of strong, vigorous plants

CAUTION: Permanent plant-bed sites are not recommended in areas where black shank is prevalent. In black shank areas, new bed sites should be selected each year, as there is too great a chance for beds to become contaminated with the black shank fungus and the fungus carried on young plants to clean fields. Also, where dark tobacco is being grown, it is not advisable to use permanent plant beds, because satisfactory black root rot-resistant varieties have not been developed. On these farms, however, a suitable plant bed site may be seeded to a summer legume, then plowed in late summer or early fall, and the site treated in the same manner as where permanent plant beds are recommended.

Tobacco Plant-Bed Management

By Russell A. Hunt, John W. Irvine, and Ira E. Massie

Plenty of healthy, vigorous, stocky plants should be ready for early transplanting if high-quality tobacco is to be produced. Enough plant-bed area should be prepared to provide, at two pullings, the plants needed for the entire crop. The first plants pulled from beds are usually free of mosaic, but at each successive pulling there are likely to be more mosaic plants in the field if a susceptible variety is grown. Vigorous, stocky plants are essential in getting a good stand.

Choose a Fertile, Well-Drained Site

Select fertile, well-drained land high in organic matter for the bed, preferably with a slight southern or eastern slope, free from shade, especially in the forenoon. An ideal place for growing plants is in an open field.

In the past it has been recommended that a new plant-bed site be used each year, but with root rot-resistant varieties and with blue mold not occurring often, it is recommended that a permanent plant bed site be used, except where dark tobacco is grown or where there is black shank.

Immediately after setting, disk or plow the old plant bed and seed it to cowpeas or soybeans, using 12 to 15 pounds of seed in a bed 9 x 100 feet. In late August, or early September, plow or disk the legume crop and treat the plant bed for weed control. This practice destroys all live roots in the soil so the wildfire bacteria have no place to live over winter. If the beds are ditched to keep water from the surrounding area from overflowing them, and are treated at the proper time with bluestone-lime in the spring, there should be no trouble from wildfire.

Use Disease-Resistant Varieties

Insofar as possible, use disease-resistant varieties. Choose a burley variety resistant to black root rot. The varieties are Ky 16, Ky 22, Ky 26, Ky 35, Ky 41A, Ky 57, and Ky 58. Ky 22, Ky 57, and Ky 58 are highly resistant to black root rot. Ky 26 is more resistant than the moderately resistant Ky 16 and Ky 41A. On

land infested with fusarium wilt use Ky 35. Where mosaic is a problem, use Ky 57, Ky 58, or Ky 35. Ky 160 is a mosaic-resistant one sucker, and Ky 151 is a mosaic-resistant dark variety, suitable for air or fire-curing. Ky 160 and Ky 151 are resistant to mosaic but not to black root rot.

Plan for a Surplus of Plants

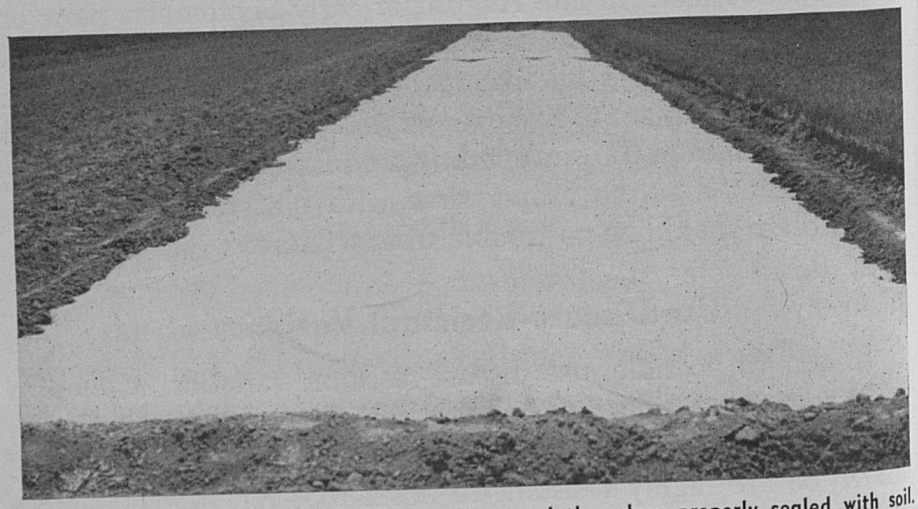
It is desirable to prepare enough plant-bed area to have a surplus of strong, vigorous plants. Provide 100 feet of bed, 9 feet wide, or 75 feet of bed, 12 feet wide, for each acre of burley to be set. For dark tobacco, prepare 50 feet of bed, 9 feet wide, or the equivalent, for each acre to be grown.

Sterilize the Soil Thoroughly

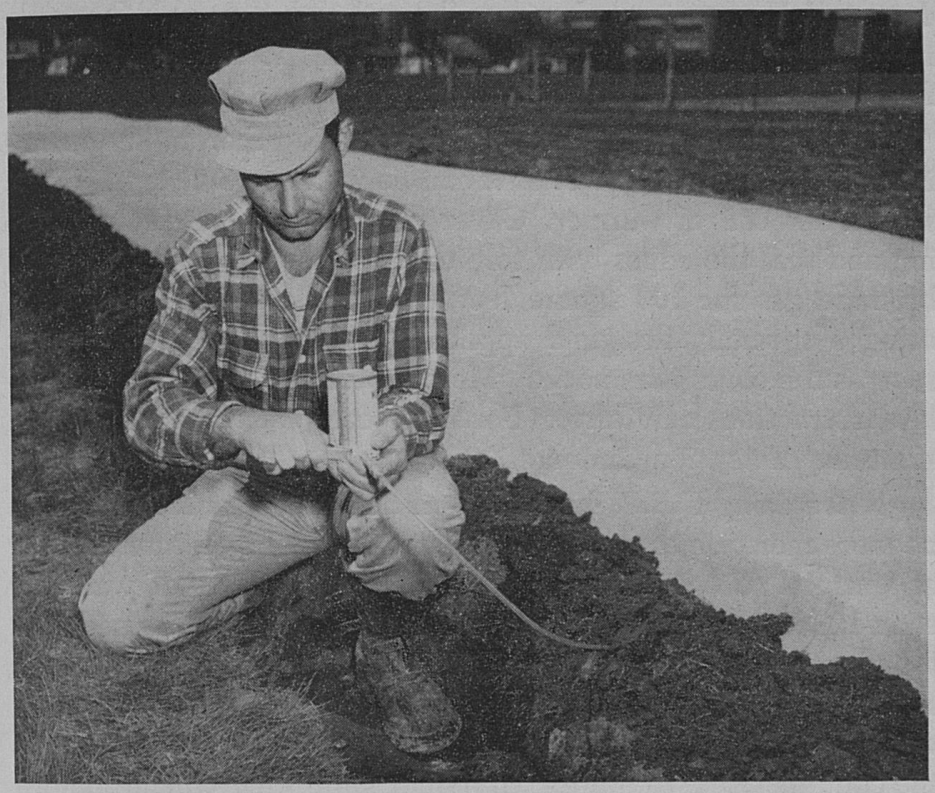
Tobacco plants are so small when they first appear that they can't stand the competition of a heavy growth of weeds. Weeding the bed is a slow, tedious, and laborious job and it is likely to injure the young tobacco plants. Also, weeding is likely to cause wildfire and mosaic.

The best way to control weeds is to sterilize the soil thoroughly. Thorough sterilization, especially in the fall, is also helpful in controlling wildfire.

Don't attempt to sterilize plant beds when the soil is wet, regardless of the method used. None of the chemicals or heat penetrates wet soil; consequently, if the soil is wet, poor sterilization is obtained. In addition, soils burned or steamed when wet



Plant bed with plastic gas-proof cover in place and the edges properly sealed with soil.



Releasing Methyl Bromide beneath gas-proof cover, using special application equipment.

may become so hard that the tobacco plants can't grow well. *For wildfire control, fall treatment is superior to treating in the spring.*

Before treating the bed for weed control, plow the soil and work it thoroughly so that only a very light raking will be necessary before seeding. Deep stirring after sterilizing will likely result in a weedy plant bed.

Beds may be treated for weed control by steaming, burning, methyl bromide, calcium cyanamid, or by drenching with C.B.P.

When burning, have soil thoroughly prepared and dry enough for good tillage. Use enough wood to heat the soil to a depth of 3 to 4 inches. Usually 30 minutes burning with fairly large wood will provide enough heat to kill weed seed near the surface. Burning with small brush for 10 to 15 minutes is worthless. Burned beds may be seeded after the soil cools.

Steaming is probably the most effective method of treating plant beds to kill weed seed and to control leafspot diseases. When using steam, prepare the site thoroughly and at each "set" leave the pan in position for approximately 25 minutes, with the steam pressure in the boiler 100 to 125 pounds. Steaming may be

done in fall or spring, whenever the soil is dry enough for working. Seeding may be done any time after the soil dries enough for raking.

When using methyl bromide, have the soil thoroughly pulverized, and just about as wet as it can be worked. Soil temperature should be 50°F or warmer. Cover the bed with gas-proof covering and seal the edges with soil, then release 1 pound of methyl bromide gas for 100 square feet, into shallow pans or troughs, using a specially designed applicator. Beds may be seeded as soon as the cover is removed. Methyl bromide is poisonous. Follow instructions carefully. (For more complete instructions, see Kentucky Extension Circular 500.)

When using C.B.P., have the soil thoroughly pulverized, with no more moisture than for good tillage, and temperature of 50°F, or warmer. Use 1 quart of C.B.P. in 12½ gallons of water for each 125 square feet of bed. To insure penetration, immediately follow treatment with a like amount of clear water. Beds may be seeded 3 weeks after treatment in cool weather, 2 weeks in warm weather. C.B.P. is poisonous to humans, so follow instructions on the container.

When using calcium cyanamid, have the soil thoroughly pulverized, with no more moisture than for good tillage. Apply ¾ pound of calcium cyanamid and ½ pound of 20 percent phosphate to the square yard and mix with 3 inches of soil. Rake the surface smooth. Apply ¾ pound more of calcium cyanamid to the square yard and rake lightly. Mulch the bed and water, using 300 to 500 gallons for a bed 100 ft. long. At seeding time prepare the surface with a hand rake, and don't stir soil deeper than 1 inch. Recommended dates for using calcium cyanamid, August 10-September 15. Beds treated with calcium cyanamid should be seeded March 20 to April 1.

Fertilize for Vigorous Growth of Plants

Fertilize a steamed, methyl bromide, or C.B.P. bed with a complete fertilizer, such as 6-8-6, or 4-10-6, at the rate of 30 to 40 pounds for a bed 9 by 100 feet, and rake in lightly. For a heavily burned bed, use 25 to 30 pounds of 20-percent superphosphate, and 10 to 12 pounds of nitrate of soda, or a mixed fertilizer, such as a 4-12-0, or similar analysis. CAUTION: Don't use too much fertilizer. If you use much more than the amounts above, soluble

salts may rise to the top of the soil, which in dry weather may cause the plants to yellow and die.

Where plants grow slowly and are yellow, treat the bed with nitrate. Dissolve 10 pounds of nitrate of soda in a 50-gallon barrel of water. Remove the cotton and sprinkle the nitrate solution evenly over the bed, with a sprinkling can, at the rate of 5 gallons to 18 running feet of bed 12 feet wide, or 24 running feet where the width is 9 feet. Follow at once with an equal amount of clear water to rinse the solution off the leaves and prevent burning.

Sow the Seed as Soon as Weather Permits

Sow 2 level teaspoons of cleaned and tested seed to each 100 feet of bed 9 feet wide, or 2½ level teaspoons of seed for each 100 feet of bed 12 feet wide. Seeding may be done as soon as weather permits, which is usually the last half of February or in March. Seeding should be completed by April 10.

To distribute the seed evenly, use a tobacco seed distributor, or mix the seed with commercial fertilizer, fine sand, or screened wood ashes. Where a seed distributor is used the seed are sown without mixing with other materials. Going over the bed at least 3 times, sowing part of the bed each time, helps to get even distribution if you are sowing the seed by hand.

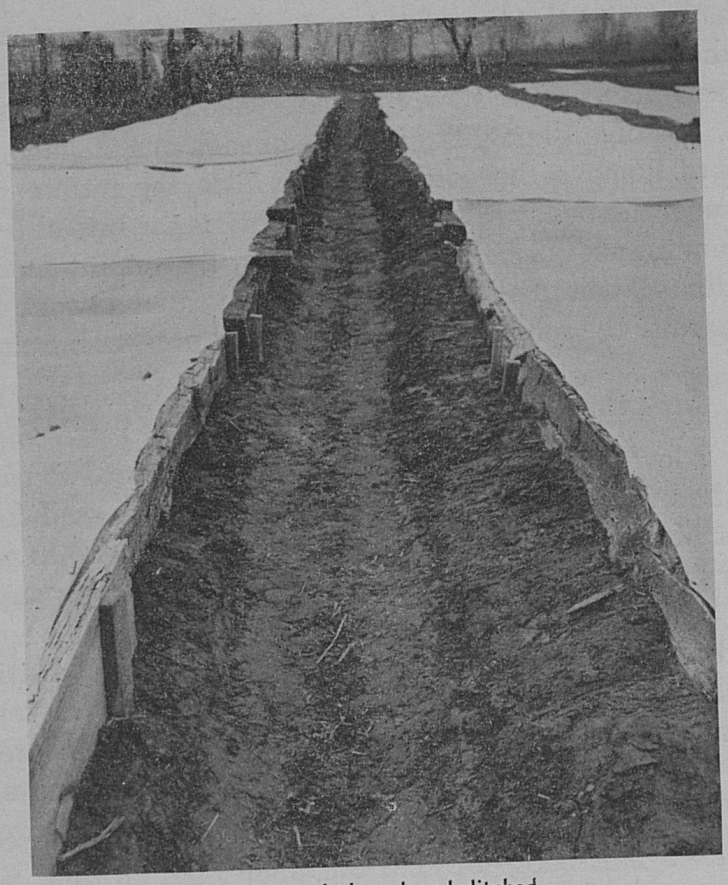
Box the Plant Bed

Boxing the bed helps to control cutworms and fleabeetles. Use 1″ by 6″ material and stretch a good grade of tobacco cotton over the top of the boards and fasten to the side. If boards are not available, uniform logs are satisfactory. Tall bottles turned upside down and stuck in the soil, will keep the cotton off the ground and prolong its life.

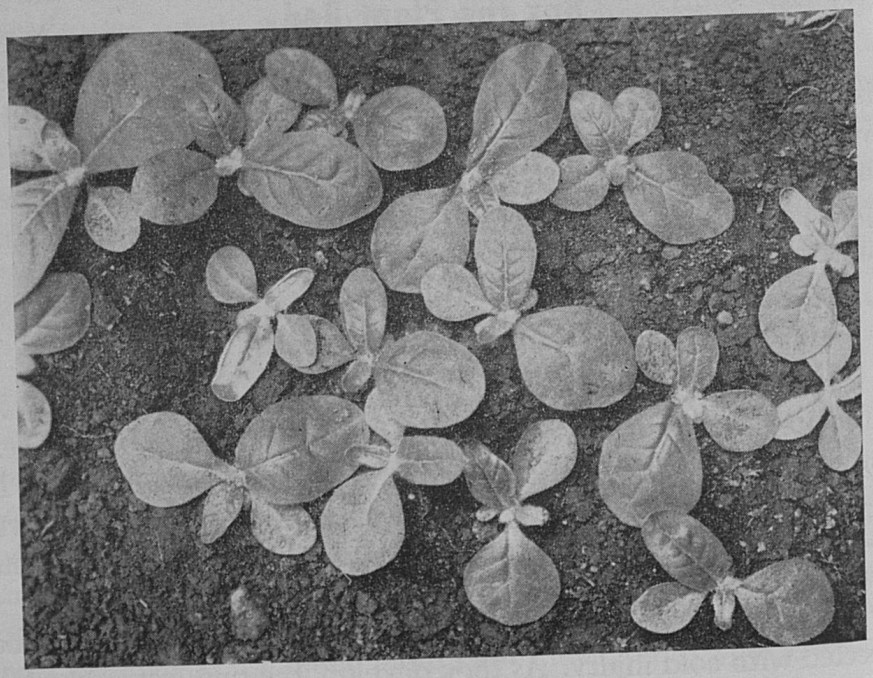
If Heavy Freezes Occur

Small tobacco plants, while injured by cold weather, are rarely killed unless the soil freezes enough to be honeycombed. Then the plants may be lifted or heaved out of the soil and die. If heavy freezes occur, remove the canvas as soon as the soil thaws, tramp or roll the soil, disregarding the plants, and then water the bed thoroughly.

Following cold weather most of the plants in the bed may be affected with cold injury. As they develop, the bud leaves of such



Bed properly boxed and ditched



Cold injury to tobacco plants in the plant bed.

injured plants are white, and the partially developed leaves are smaller than normal and white along the edges. With warmer weather the affected plants recover quickly and grow normally, except that the affected leaves appear mottled, with somewhat the appearance of mild mosaic.

Control Wildfire and Angular Leafspot

Plowing under a legume in late summer, treating for weeds in the fall, ditching the bed to keep surface water from flowing over it, plus the use of bluestone-lime, will effectively control wildfire and angular leafspot in the plant bed. In the spring as soon as the tobacco plants can be seen they should be treated with bluestone-lime, and again 7 to 8 days later. If weeding is necessary, bluestone-lime should be applied immediately after, on the same day, that weeding is done.

In using bluestone-lime, treat the bed and at least 3 feet beyond the sides and end of the bed. Most of the failures with bluestone-lime are due to its being used too late. Unless the first application is made before the plants are the size of a dime, the bluestone-lime applications are worthless.

To Prepare Bluestone-Lime Mixture: (1) Fill a clean 50-gallon barrel or oil drum ¾ full of water strained through a cloth. (2) In one container thoroughly mix 4 pounds of fresh com-

Tobacco plants ready for the first bluestone-lime treatment.

Sprinkle sides and end of plant bed with bluestone-lime

mercial hydrated lime in 3 or 4 gallons of strained water. (3) In another container dissolve 3 pounds of powdered bluestone in about 4 gallons of water. (4) Pour the lime paste into the barrel of water and stir vigorously. While stirring, add the bluestone solution slowly. (5) Add water to make 50 gallons. Add ½ pound of 50-percent wettable DDT to control cutworms and flea-beetles.

Apply without removing the cotton cover, with an ordinary sprinkling can. Stir each time the sprinkling can is filled. Use 1 quart per square yard. Fifty gallons will treat 140 running feet of bed 9 feet wide, or 100 running feet of bed 12 feet wide, and provide enough material for the plowed area on each side and ends of bed for a distance of 2 to 3 feet.

Control Mosaic

Mosaic is a serious tobacco disease for many farmers. It may be prevented by growing mosaic-resistant varieties as mentioned in Section 2 above, or by seeing that workers do not use home-spun or barn-cured tobacco while working in plant beds. If the

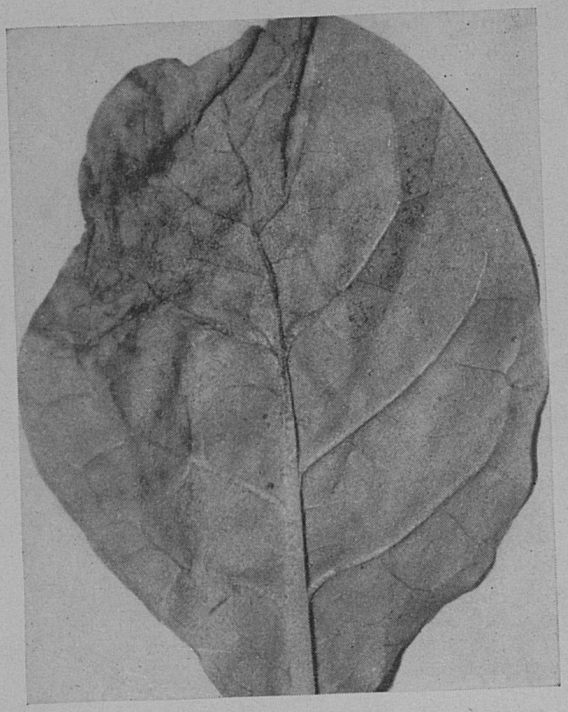
Wildfire on a tobacco plant nearly ready to set. Plants half grown or larger are rarely killed, but their growth may be retarded.

workers chew, make up twists from a mosaic-resistant variety like Ky 57 or Ky 35. To prevent mosaic, the pockets of the workers should be brushed clean and the hands thoroughly scrubbed before going to the plant bed, and the workers should not smoke or chew home-cured tobacco when weeding plant beds or pulling and setting plants. Manufactured plug, twist, cigarettes, or pipe tobacco is relatively safe to use if one must use tobacco, but cigarettes should not be made from granulated tobacco.

Dipping the hands in a strong solution of trisodium phosphate, where obtainable, from time to time while weeding or pulling plants, will prevent mosaic infection nearly completely, even when barn-cured tobacco is used by workmen.

Control Blue Mold

Blue mold does not occur regularly in Kentucky. If blue mold appears early in your neighborhood, treat the bed with Ferbam or Zineb either as a spray or dust, twice a week, and after each rain, from the time the disease is first reported spreading in the neighborhood until the plants are set. Use 3 tablespoons of Ferbam or 2 of Zineb to 1 gallon of water, and apply 4 to 6 gal-



Blue mold showing spore masses on the under side of a leaf. These spores, when blown about, cause new outbreaks in the same bed and in beds at a distance.

lons, or 2 to 3 pounds of properly diluted dust to a bed 9 x 100 feet. Beds severely injured with the blue mold should be nitrated to hasten recovery.

Danger of Blackleg in Wet Seasons

Blackleg occurs in the plant bed during wet periods when the plants are about ready to be set. It is a bacterial soft rot attacking leaves that touch the ground and spreading from them into the soft, tender stalk. The stalk may rot off completely, or the disease may spread up one side, splitting it open. The rotted areas usually turn black. Frequently the plants in an area up to 3 feet in diameter are destroyed. Slightly affected plants when set in the field grow normally if set in rather dry soil, but if the setting season is wet it is not advisable to use plants from an affected bed.

Pull Weeds No More than Necessary

Most plant beds must be weeded once, many two or more times. Do only as much weeding as is necessary to keep weeds under control.

Blackleg of tobacco occurs in the plant bed as a soft rot, when the plants are about ready to set.

Repeated weedings cause mosaic if workers use homespun tobacco, and wildfire if weeds are pulled out of the bed. Use a sharp knife and cut weeds at the surface of the soil rather than pulling them out. Pulling weeds disturbs the surface of the soil and permits wildfire to attack young plants even when the bluestone-lime mixture was used at the proper time. Always follow weeding with an application of bluestone-lime to prevent wildfire. The application should be made immediately after weeding, not two or three days later.

Water the Plants in Dry Weather

Rapidly growing plants evaporate much water from the soil, and in dry weather beds must be watered or growth will be checked and the plants injured. Watering is a laborious operation, but necessary in many seasons if strong, thrifty plants are to be produced. It is better to give the plant bed a thorough watering once every 6 to 7 days than to water lightly every few days. A barrel of water for every 100 square feet of bed is enough. It is the equivalent of about ¾ inch of rain. Seldom are there seasons when watering will not be a help in producing strong, early plants.

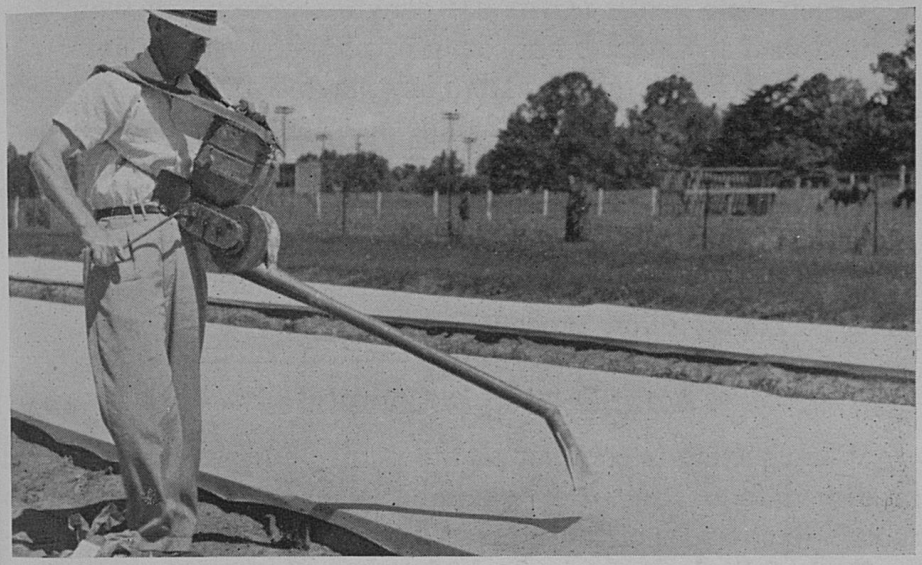
Weeding is a laborious job

If weather is dry in late April and early May, small tobacco plants ¼ to 2 inches across may turn yellow and die or, when touched, break off at the surface of the ground. Usually the area in the bed where this occurs has a white coating over the surface soil particles made up of salts carried to the surface by evaporating water. These salts injure the small roots of the plants and prevent growth of new roots from the crown. Such a condition is usually brought about by applying too much fertilizer to the surface of the bed before sowing, or from too much potash salts following burning a bed with wood. If the season is wet continuously no harm will result, but if the season is dry, even for short periods, plants in large areas of the bed may die. Similar injury sometimes follows the use of calcium cyanamid for weed control.

If too much fertilizer has been used, or if the bed has been treated with calcium cyanamid, and the plants are yellowing in a dry period, water the bed heavily to dilute the salts and carry them into the soil.

Control Insects

To control cutworms and fleabeetles in the plant bed use DDT as a spray or as a dust. The material may be applied by itself or



Dusting to control insects

it may be put on as the bluestone-lime is applied. One pound of 10-percent DDT applied as a dust, or ¼ pound of 50-percent wettable powder in 25 gallons of water for a bed 9 x 100 feet will give effective control. One-half pound of 50-percent wettable powder in each barrel of bluestone-lime mixture has proven effective in controlling fleabeetles and cutworms.

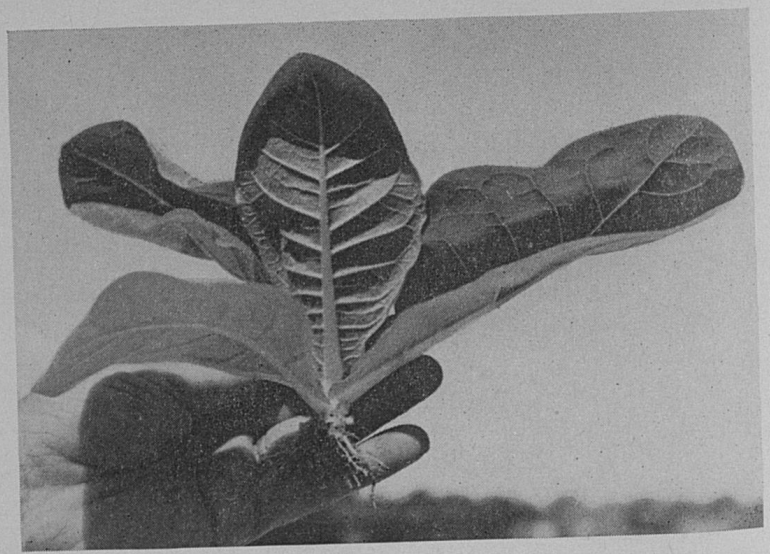
Green June beetle larvae killed

Green June beetle larvae are commonly found in plant beds located near livestock barns, or in areas where stable manure or rotting straw have been spread. They may be controlled by spraying with aldrin at the rate of 2 ounces of actual aldrin or by dusting with 1 percent parathion dust at the rate of 2 pounds to a bed 9 x 100 feet. The parathion may be applied at the time the bed is seeded, or later through the cotton cover of the bed. The cloth must be dry when the parathion dust is applied. *Caution:* When using parathion follow precautions printed on the package.

After Setting is Completed —

When setting is completed, the plant beds should be plowed or disked to destroy the remaining plants, and the bed again seeded to cowpeas or soybeans as above recommended.

Early fall plowing of new bed sites will give an opportunity for all plants turned under to decay before cold weather. If beds are burned, gassed, chemically treated, or steamed in the fall rather than in the spring, the roots are more likely to be destroyed and the soil come through the winter free from wildfire bacteria. Spring-plowed beds are almost certain to be contaminated by the wildfire bacteria unless they are thoroughly steamed. Burning, as it is usually done, does not kill the roots of the plants turned under or the bacteria on them.



A sturdy plant ready for transplanting

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