the european CHAFER

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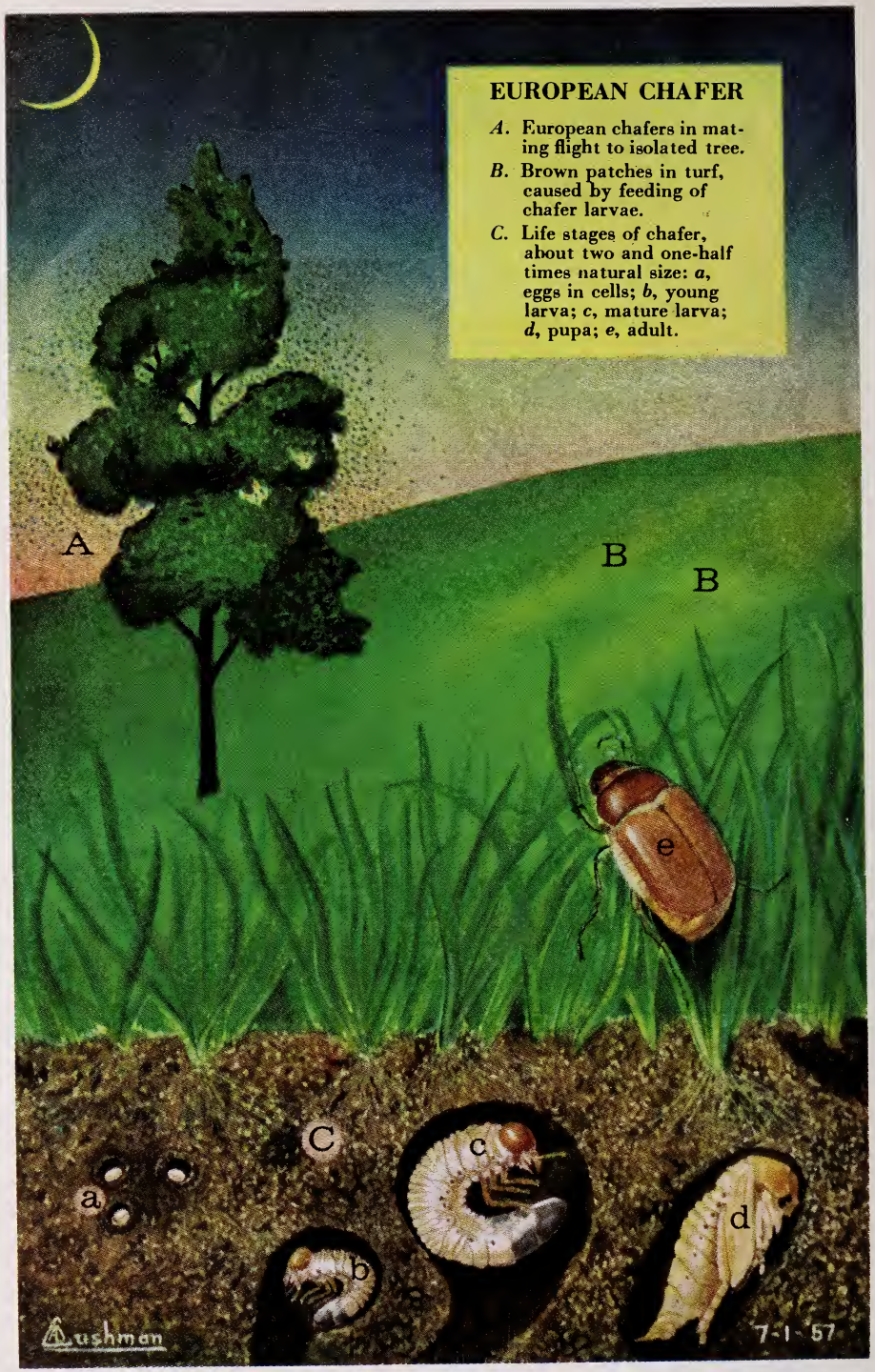
EUROPEAN CHAFER
A. European chafers in mating flight to isolated tree.
B. Brown patches in turf, caused by feeding of chafer larvae.
C. Life stages of chafer, about two and one-half times natural size: a, eggs in cells; b, young larva; c, mature larva; d, pupa; e, adult.
A
B
B
e
C
a
b
c
d
Cushman
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the european CHAFER

European chafers are pests of grasses, legumes, and winter grains. Larvae damage or destroy lawns and pastures, and leave unsightly bare spots that subject the soil to rapid erosion.

It is believed that a few of these pests entered the United States from overseas in the late 1920's or early 1930's. Their numbers built up gradually until the first infestation, in New York State, was discovered in 1940. Since then, they have been found in Connecticut, West Virginia, New Jersey, Pennsylvania, Ohio, and Massachusetts. If left to spread unchecked, they could infest much of the United States.

Insecticides that kill European chafers may only be used on nonagricultural land, because they leave residues on plants and in the soil.

Your Federal and State governments control the European chafer with surveys to find it, quarantines to keep it from moving to new areas, application of insecticides to eradicate it, and research to find safer, more effective ways to combat it.

HOW IT DEVELOPS AND SPREADS

The European chafer develops in four stages—egg, larva (grub), pupa, and adult (beetle). Of these, only the larva is destructive.

In June or July, female beetles lay 20 to 40 eggs, 2 to 6 inches deep in the soil. Soon afterward the beetles die.

Larvae hatch in 2 to 3 weeks and start feeding on roots of grasses and other plants. They are full grown in about 3½ months. At this time, they are C-shaped, about ¾ inch long, and have white bodies and brown heads. Larvae feed until cold weather and then burrow below the frostline. The following spring they come nearer the surface and resume feeding. Most larvae then change to pupae, the dormant stage, but some spend a second summer as larvae and mature the second spring. At first, pupae are creamy white and soft bodied; they harden and become reddish brown just before they change to beetles.

Beetles are oval, about ½ inch long, and light brown or tan. They resemble May beetles (also called June beetles). Shallow grooves run lengthwise on their forewings.

Around the middle of June, beetles emerge from the soil. They make brief mating flights at sunset on warm days. Thousands of them swarm like bees around trees, tall shrubs, and light poles. After they fly for about half an hour, they settle on the objects to mate. At dawn they burrow into the soil and the females lay eggs. Beetles usually make several mating flights between mid-June and mid-July.

Beetles can fly as far as 2 miles on a mating flight. They can be spread much farther, however, in automobiles, railroad cars, and aircraft. All stages of the insect can be spread long distances in gravel, soil, and sod, and on roots that have soil around them.

SURVEYS

Plant pest control workers conduct surveys to determine where controls and quarantines are needed. These workers commonly use traps to find the beetles. Traps are of two types—those that use specific wavelengths of light and those that use chemical odors to attract the insects. In addition, workers patrol threatened areas in order to spot new outbreaks before they become widespread.

QUARANTINES

To slow down the chafer's spread, the U.S. Department of Agriculture and States where chafers have been found have established quarantines. The Federal quarantine is designed to prevent interstate spread of the pest; State quarantines serve to halt its spread within State borders.

Shippers cannot move certain articles from quarantined areas without a certificate stating that the articles are free of European chafers. If chafer eggs, larvae, pupae, or beetles are found, infested articles must be treated with insecticide or washed to remove the infestation before they may be shipped from the area.

APPLICATION OF INSECTICIDES

When an isolated infestation is found, plant pest control workers sometimes apply insecticides; this is done only when the infestation is small enough to make eradication practical. Workers use either airplanes or ground equipment, depending on the size of the infested area and the terrain.

RESEARCH

Entomologists, chemists, engineers, and other USDA scientists are searching for new and safer ways to control the European chafer.

Finding chemicals that kill the European chafer without leaving a hazardous, illegal residue on crops and pastureland is one research goal. Two chemicals from a group known as organophosphorus insecticides have proved promising in tests so far. These chemicals last long enough to give control for one season, but not long enough to make treated crops and forage unsafe for use thereafter.

Non-chemical methods of control are also being tested. For example, scientists and engineers are trying to adapt the blacklight survey traps for control use. These workers have also tried to introduce a virus disease to which

Guide for applying insecticide to control the European chafer in lawns, turf, and other nonagricultural land

Insecticide	Amount to apply to 1,000 square feet			
	Wettable powder		Dust or granules	
	25 percent	50 percent	5 percent	10 percent
Dieldrin	4½ ounces	2¼ ounces	1¼ pounds	10 ounces
Aldrin	4½ ounces	2¼ ounces	1¼ pounds	10 ounces
Heptachlor	4½ ounces	2¼ ounces	1¼ pounds	10 ounces
Chlordane	1 pound	½ pound	4½ pounds	2¼ pounds

European chafers are susceptible, and a parasite which attacks the chafers but which is harmless to man.

One of the most dramatic nonchemical methods now being tried is the sterile-male technique. Male European chafers are sterilized when they are pupae with precise doses of gamma radiation. When they mature, they are released to mate with normal females, who then lay sterile eggs. This method has proved promising in preliminary tests and could be the answer to the problem of eradicating this pest from all types of land.

WHAT YOU CAN DO

Your help is needed to contain the European chafer. You can help if you do these things:

Report infestations. Signs that the European chafer may be infesting your area are—

- Large numbers of beetles swarming around trees, shrubs, or light poles on June or early July evenings;
- Dead or dying spots in lawns, turf on golf courses or cemeteries, pastures, or fields of winter grain;
- White grubs feeding on roots around the edges of bare spots in sod or grainfields; and
- Loosened soil in the bare spots, indicating that birds and small animals have been digging for larvae.

These signs could also indicate an infestation of Japanese beetles or May beetles, which are also destructive insects. If you have reason to believe that European chafers are infesting your property, collect specimens of larvae or beetles in a small jar of rubbing alcohol and give or mail them promptly to your county agricultural agent, your State extension entomologist, a local plant pest control representative, or the Plant Pest Control Division, U.S. Department of Agriculture, Hyattsville, Md. 20782. Include your name and address, the date you collected the specimens, and a note stating that they may be the European chafer. *Do not send live insects through the mail.*

Apply insecticide to nonagricultural land. If you find an infestation on land that is not used for crops, pasture, or other agricultural purposes, apply an insecticide.

To treat large areas of nonagricultural land, apply dieldrin, aldrin, or heptachlor at 3 pounds of active ingredient per acre; or apply chlordane at 10 pounds of active ingredient per acre.

Purchased products may contain 5 to 50 percent of active ingredient. The strength is stated on the label.

To treat small areas, apply insecticide according to the table. After you apply insecticide, water the area but do not flood.

Comply with State and Federal quarantine regulations. You can get more information about movement of articles from quarantined areas from your State department of agriculture, your county agricultural agent, or USDA plant pest control officials.

Cooperate with local plant pest control officials and persuade your neighbors to cooperate.

PRECAUTIONS

Pesticides used improperly can be injurious to man, animals, and plants. Follow the directions and heed all precautions on the labels.

Store pesticides in original containers under lock and key—out of the reach of children and animals—and away from food and feed.

Apply pesticides so that they do not endanger humans, livestock, crops, beneficial insects, fish, and wildlife. Do not apply pesticides when there is danger of drift, when honey bees or other pollinating insects are visiting plants, or in ways that may contaminate water or leave illegal residues.

Avoid prolonged inhalation of pesticide sprays or dusts; wear protective clothing and equipment if specified on the container.

If your hands become contaminated with a pesticide, do not eat or drink until you have washed. In case a pesticide is swallowed or gets in the eyes, follow the first aid treatment given on the label, and get prompt medical attention. If a pesticide is spilled on your skin or clothing, remove clothing immediately and wash skin thoroughly.

Do not clean spray equipment or dump excess spray material near ponds, streams, or wells. Because it is difficult to remove all traces of herbicides from equipment, do not use the same equipment for insecticides or fungicides that you use for herbicides.

Dispose of empty pesticide containers promptly. Have them buried at a sanitary land-fill dump, or crush and bury them in a level, isolated place.

NOTE: Some States have restrictions on the use of certain pesticides. Check your State and local regulations. Also, because registrations of pesticides are under constant review by the U.S. Department of Agriculture, consult your county agricultural agent or State Extension specialist to be sure the intended use is still registered.

Prepared by

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