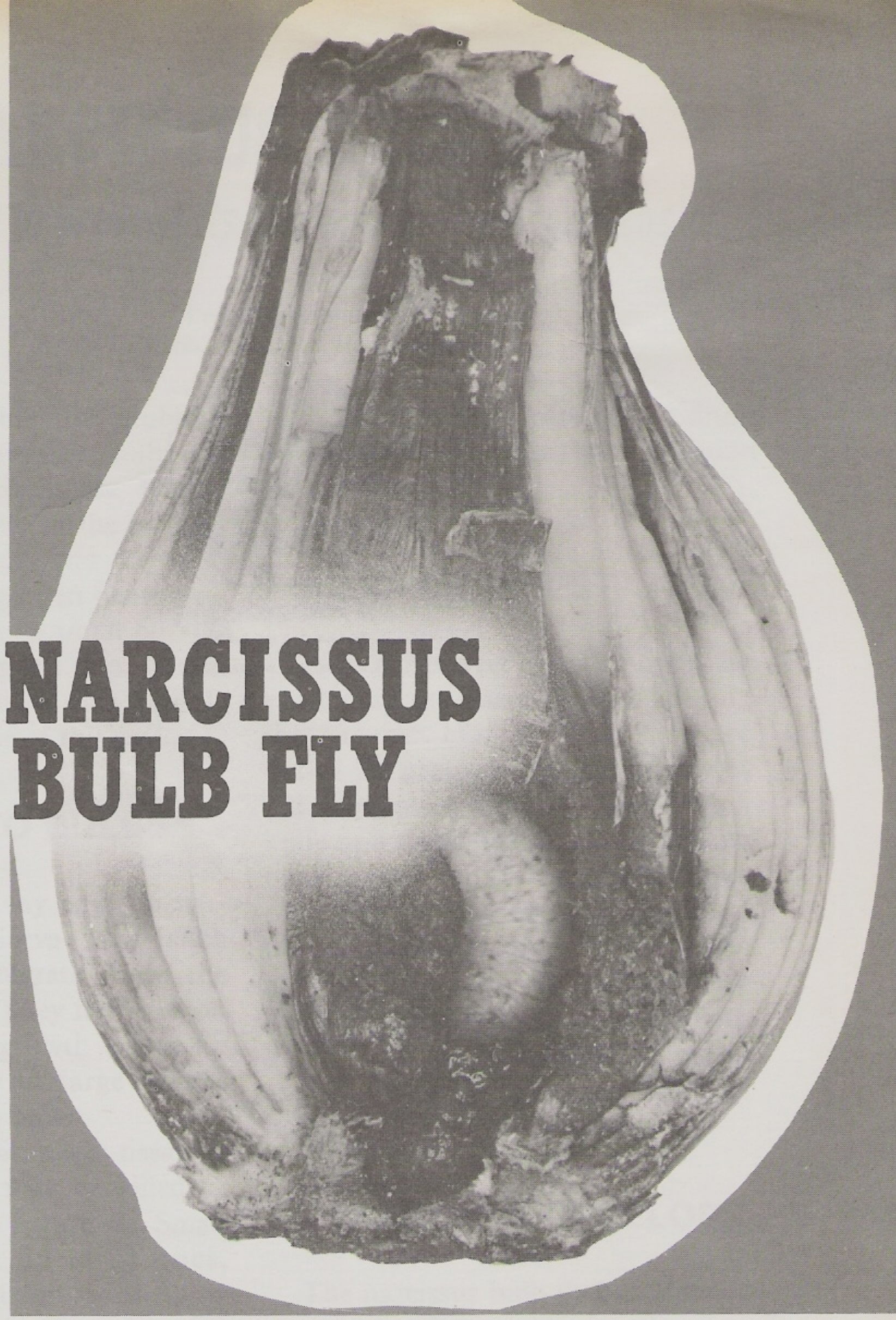

the NARCISSUS BULB FLY

how to prevent its damage in home gardens

LEAFLET NO. 444

Agricultural Research Service
U.S. DEPARTMENT OF AGRICULTURE

Use Pesticides Safely

FOLLOW THE LABEL

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the NARCISSUS BULB FLY

how to prevent its damage in home gardens

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The narcissus bulb fly[2] probably occurs wherever narcissus bulbs are grown in the United States. It may infest 20 to 30 percent of the bulbs in commercial plantings, and 50 to 75 percent of those in garden plantings.

This fly resembles a small bumble bee in color and general appearance. (A drawing of the adult female appears on the cover of this leaflet.)

DAMAGE TO BULBS

The female flies lay eggs on narcissus leaves. The larvae that hatch from these eggs migrate down the plants to the roots. They first feed on the basal plate, or growth center, of the bulb. Later they eat large cavities in the centers of the bulbs.

When the basal plate tissue is damaged, the bulb may be killed or its growth may be retarded. Small bulbs usually die. In large ones, enough base is left uninjured to allow some growth, but this tissue does not become normal again for 2 or 3 years. If the central area of the basal plate is destroyed, several small bulbs may develop around the undamaged edges. These bulbs take at least 2 years to reach normal size.

Injured bulbs produce only a small amount of foliage—often just a single leaf. This is the result of infestation the previous season.

SIGNS OF INFESTATION

You can detect infested bulbs by examining the bases of bulbs during the summer months when they are out of the ground. Clean the soil and old roots away from the base with a knife or a small, stiff brush. A sunken brown area in the normally white root ring, at the edge of the basal plate, indicates that it has been attacked by a narcissus bulb fly maggot. Cut the brown spot out with a knife and you will see discoloration extending up the side and into the bulb.

HOW THE FLY DEVELOPS

The narcissus bulb fly has four life stages—egg, larva (or maggot), pupa, and adult. There is normally one generation a year.

Egg.—The eggs are chalk-white, elongate oval, and about 1/16 inch long. They can be seen on the leaves near the base of the plant, or in the soil.

Larva.—The eggs hatch in about 10 days. When newly hatched, the larvae are about 1/15 inch long. They wriggle down through the soil at once, enter the bulbs through or near

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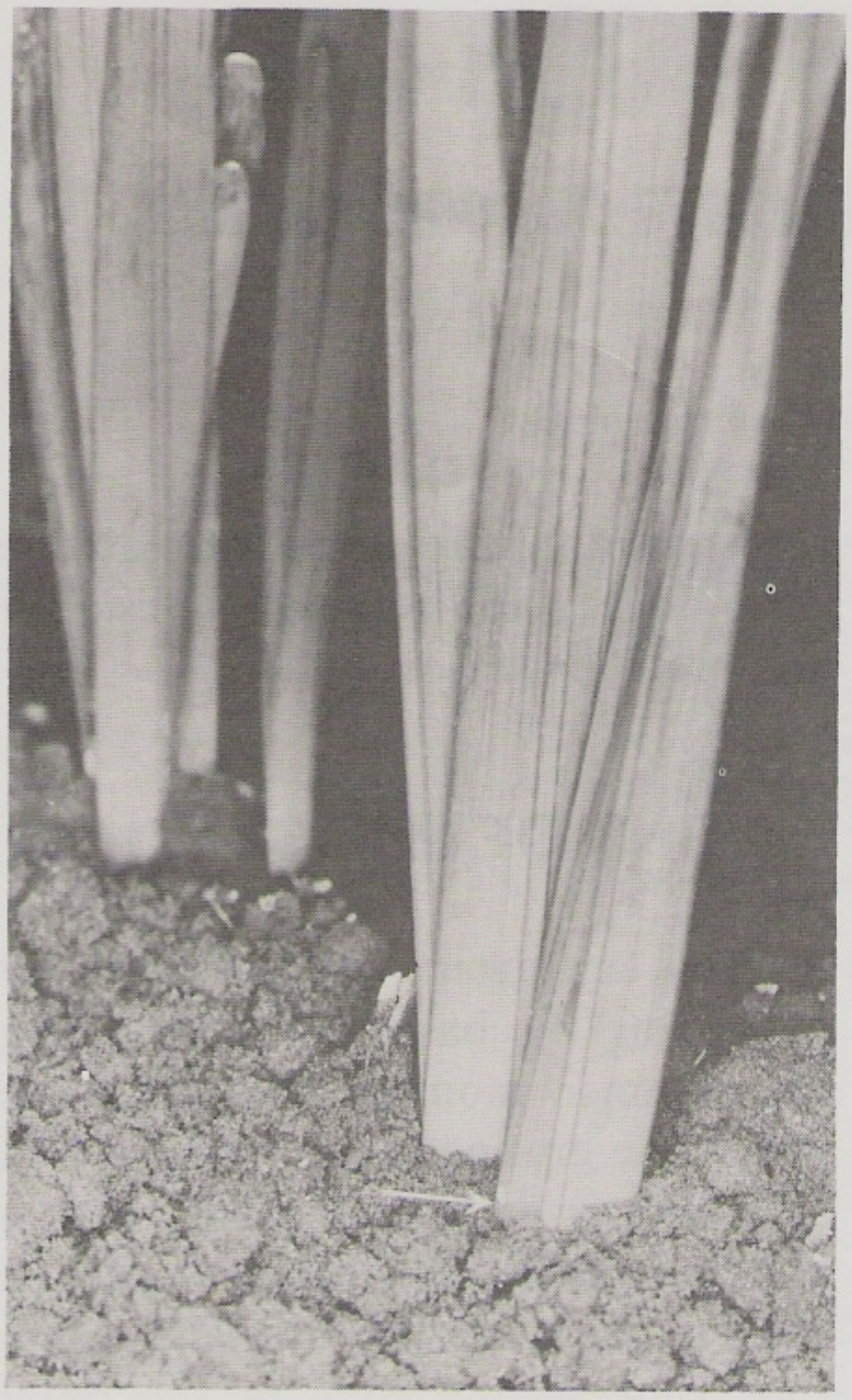
[1]Beltsville Research Center, Beltsville, Md. 20705.

[2]Lampetia equestris.



PN-5105

An egg of the narcissus bulb fly on a narcissus leaf just above the surface of the ground.

the roots, and develop during the summer and fall.

Usually only one larva is found in a bulb. Occasionally a larva will consume all the inside of the bulb before reaching maturity, and will attack another one.

While inside the bulb, the larva passes through three stages of development. In the first one, which lasts several weeks, it tunnels back and forth in the base of the bulb. In the second and third stages, the larva moves upward into the center of the bulb, enlarging the cavity as it grows. The mature larva remains inactive in the hollowed bulb through the winter.

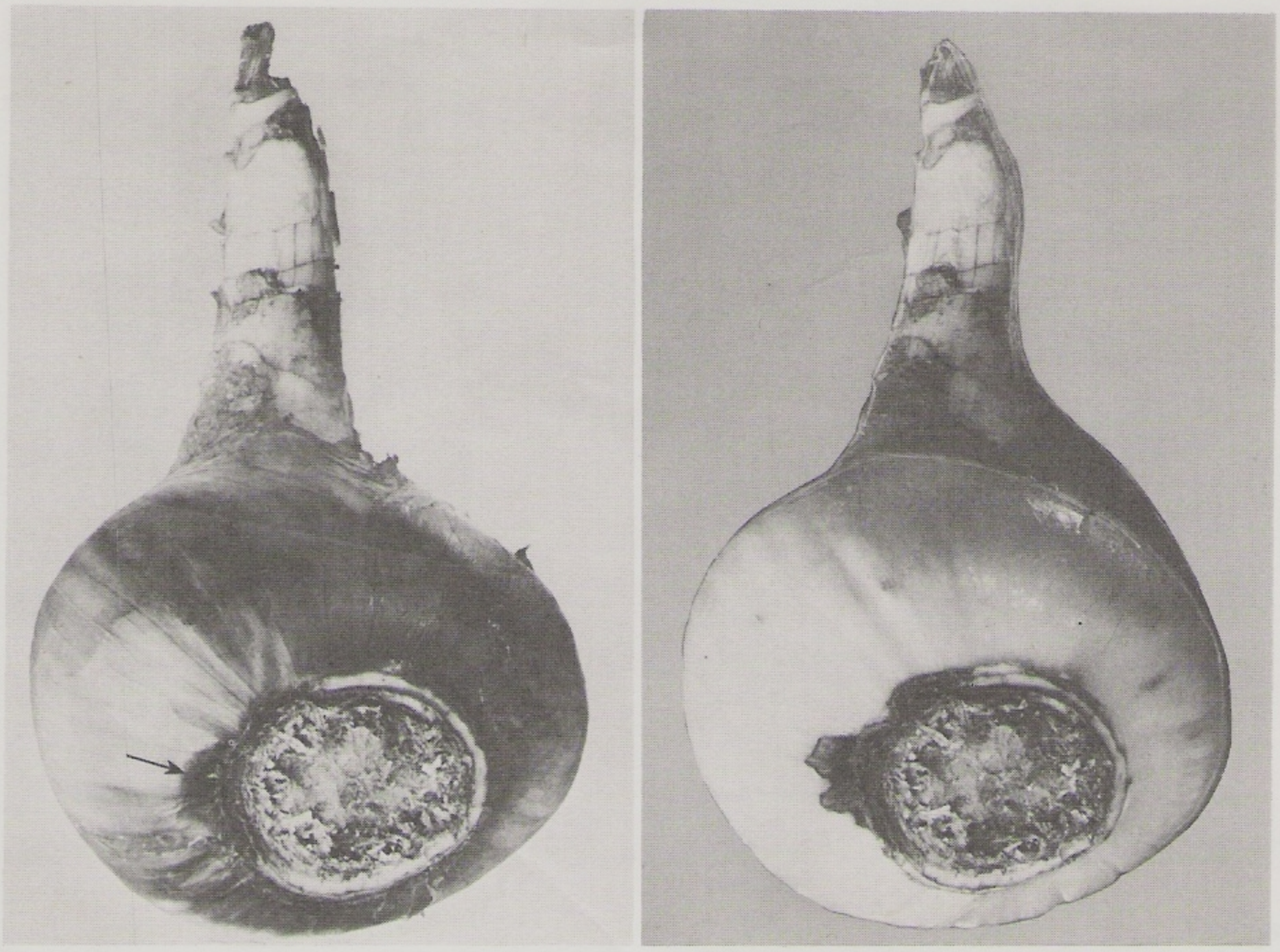
Each larva sheds its skin twice as it develops. Larvae are about 3/4 inch long when fully grown. The dirty-tan body is plump, slightly arched, and nearly circular in cross section. It has a tough, wrinkled skin. The breathing tube at the hind end is almost black. Black mouth hooks in the slightly tapered head are used to tear bulb tissue. The larva contracts its body when it is handled; if its mouth hooks are touched it quickly draws them in almost out of sight.

Occasionally a larva may be retarded in development and remain small during the summer and fall. The next spring it will resume growing and will pass its second winter as a fully developed larva.

Pupa.—In early spring the larva leaves the bulb and moves near the surface of the soil. Its skin hardens and darkens, and the ends of its body become rounded. This larval skin becomes the pupal case, or puparium, within which the larva transforms into the pupa. Its tip barely shows above the surface of the soil.

PN-5106

Feeding tunnels in basal plate of a narcissus bulb.



PN-5103 PN-5104

Left: Dark, sunken part of the edge of the basal plate of a narcissus bulb indicates that the bulb is infested. Right: The same bulb with outer dried scales removed shows that discoloration extends into the living scale tissue.

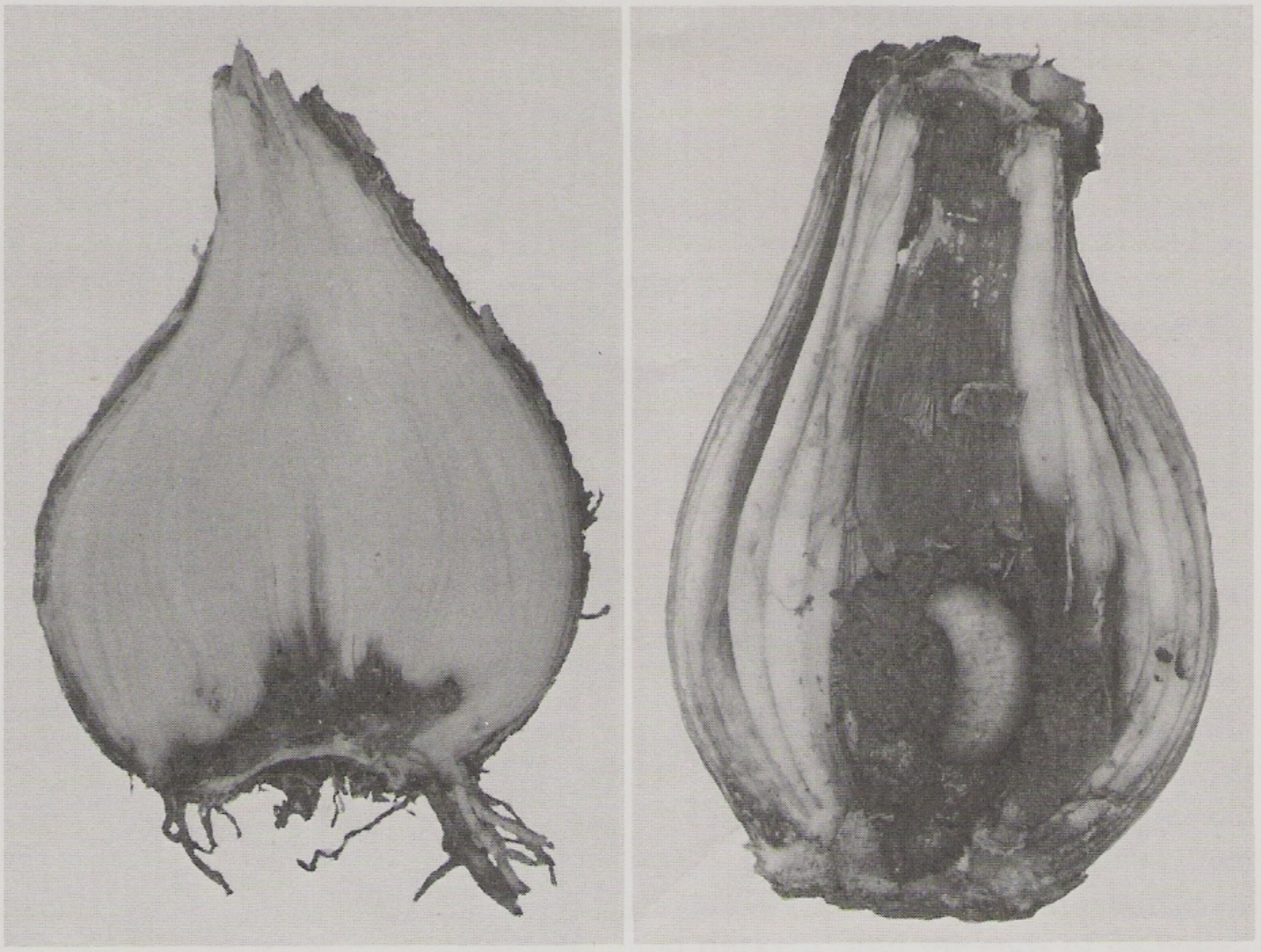
Several days after the start of the pupal stage, two breathing tubes resembling horns emerge on the upper side of the puparium toward the front.

The larva changes to the adult fly during the pupal stage. When it is ready to emerge, the fly pushes off the cap of the puparium, wriggles out, and climbs a nearby stem, where it spreads out and dries its wings.

Adult.—The adult is about 1/2 inch long. Its black body is covered with bands of long, colored hairs. These bands appear in combinations of black, yellow, orange, and buff, and give the flies many variations in color pattern.

The adults appear in late spring and early summer, and are most active on warm, sunny days. They fly in a zigzag fashion along rows of plants or among leaves, 8 to 10 inches above the ground, and produce a peculiar high-pitched hum. They feed for about a week before laying eggs. They feed on pollen and nectar from the blossoms of numerous fruits and flowers, including strawberry, apple, morningglory, buttercup, and dandelion.

Each female lays 50 to 75 eggs singly on narcissus leaves at the ground level or as far below this level as she can. Occasionally eggs are deposited in the soil near the leaves. Since the flies prefer protected places, they usually do not lay their eggs on



PN-5107 PN-5108

Two stages in the destruction of a bulb by the narcissus bulb fly. Left: The basal part of the bulb has been seriously injured by the feeding of a maggot in its early stages. Right: A large part of the bulb has been eaten out by the maggot, which is now full grown.

narcissus plantings in open, wind-swept areas.

NONCHEMICAL CONTROL METHODS

Discard and burn or otherwise destroy all soft and rotting bulbs. To retard egg-laying adults some protection can be obtained by covering the plants with cheesecloth in the early summer (May-June).

CHEMICAL CONTROL

Use trichlorfon (Dylox R) as a soil drench and follow all label directions. Direct stream at base of plants at the beginning of adult activity (May-June). Repeat this application annually.

USE OF PESTICIDES

This publication is intended for nationwide distribution. Pesticides are registered by the Environmental Protection Agency (EPA) for countrywide use unless otherwise indicated on the label.

The use of pesticides is governed by the provisions of the Federal Insecticide, Fungicide, and Rodenticide Act, as amended. This Act is administered by EPA. According to the provisions of the Act, "It shall be

PN-5109

Single leaves usually indicate that the bulbs from which they are developing have been practically destroyed by narcissus bulb fly maggots.

unlawful for any person to use any registered pesticide in a manner inconsistent with its labeling." (Section 12 (a) (2) (G))

EPA has interpreted this Section of the Act to require that the intended use of the pesticide must be on the label of the pesticide being used or covered by a Pesticide Enforcement Policy Statement (PEPS) issued by EPA.

The optimum use of pesticides, both as to rate and frequency, may vary in different sections of the country. Users of this publication may also wish to consult their Cooperative Extension Service, State Agricultural Experiment Stations, or County Extension Agents for information applicable to their localities.

The pesticides mentioned in this publication are available in several different formulations that contain varying amounts of active ingredient. Because of this difference, the rates given in this publication refer to the amount of active ingredient, unless otherwise indicated. Users are reminded to convert the rate in the publication to the strength of the pesticide actually being used. For example, 1 pound of active ingredient equals 2 pounds of a 50 percent formulation.

The user is cautioned to read and follow all directions and precautions given on the label of the pesticide formulation being used.

Federal and State regulations require registration numbers on all pesticide containers. Use only pesticides that carry one of these registration numbers.

PN-5110

Soil has been removed to reveal puparia of the narcissus bulb fly just below the surface of the ground.

USDA publications that contain suggestions for the use of pesticides are normally revised at 2-year intervals. If your copy is more than 2 years old, contact your Cooperative Extension Service to determine the latest pesticide recommendations.

The pesticides mentioned in this publication were federally registered for the use indicated as of the issue of this publication. The user is cautioned to determine the directions on the label or labeling prior to use of the pesticide.

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