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G83-638 Strawberry Pests

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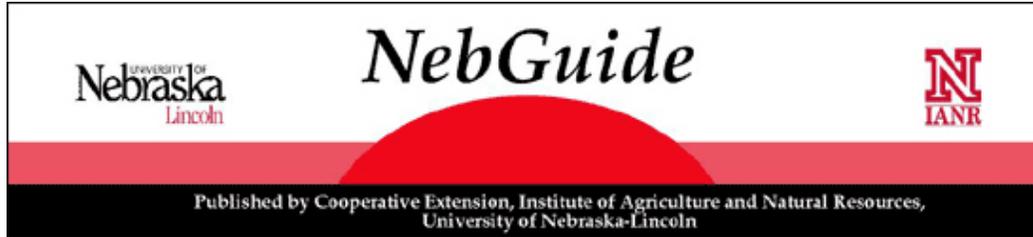
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Strawberry Pests

This NebGuide discusses the more common pests of strawberries in Nebraska, their damage, and recommended control procedures.

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Several pests attack strawberries and cause varying types and degrees of injury. Damaging infestations of strawberry pests do not occur in Nebraska in most years. However, control measures are occasionally required to maintain quality, yield, and health of the strawberry bed.

Root and Crown Feeders

Strawberry Crown Borer *Tyloderma fragariae* (Riley)

The adult borers are 1/5 inch long, short-snouted, reddish-brown, flightless weevils with three pairs of darker spots on the wing covers. The beetles overwinter under surface debris in beds or nearby protected areas. Weevils become active in the spring about the time flower buds open. Eggs are deposited in holes eaten in the crown and hatch in about a week. The yellow to pinkish, legless grubs feed in the crown, transform to the pupal stage in their burrows in late summer, and emerge as adults in the fall. The new adults feed on the leaves prior to moving to overwintering sites.

Adults injure plants by chewing holes for depositing eggs in crowns and in the bases of leaf stems. Leaf feeding is insignificant except when high populations of weevils are present in newly planted beds. Larvae boring in the crowns cause weakened, stunted plants and, if numerous, may even kill plants.

Control. As adults do not fly, barriers can be effective. Boards, coated with Tack Trap® Tanglefoot® or other suitable sticky material, and erected flush with the soil surface around the perimeter of uninfested beds may prevent adults from moving in and laying eggs. This barrier must be maintained regularly to ensure the presence of a clean, sticky surface and to prevent bridging of the barrier by plants or debris. If a bed becomes infested, destruction of the bed after the last picking and then rotation to a new area at least 300 feet away will reduce the problem for a time.

Chemical control consists of spraying the foliage and crowns to kill the adults before they deposit eggs. Begin treatments when overwintered adults appear on plants and repeat them at 7- to 10- day intervals as long as adults continue to move into beds. No insecticides are specifically registered for this pest but malathion, carbaryl (Sevin) or methoxychlor, applied at the rates listed for strawberry root weevils, should reduce crown borer infestations.

Strawberry Root Weevils *Otiorhynchus* spp.

Adults are flightless, blunt-snouted, dark reddish-brown to black beetles up to 2/5 inch in length. There are rows of pits on the hard-shelled wing covers. Immatures are typical weevil larvae--legless, white, wormlike, thick-bodied grubs up to 1/2 inch long with tan heads. Winter may be spent in the soil as full grown larvae, pupae or adults, or as adults in sheltered areas and structures. Overwintered larvae and pupae complete development in the spring and emerge as adults beginning in late May or early June. Overwintered adults may appear in beds in early May. Egg laying occurs throughout the summer with each weevil depositing 150 to 200 eggs in the soil. Eggs usually hatch within 10 days and larvae burrow down to feed on roots until activity is stopped by cold weather. Adult feeding is insignificant and is restricted to eating notches out of leaves. Larval root and crown feeding result in weakened, stunted, or dead plants, particularly if the crown is girdled.

Control. Cultural controls are as those listed for strawberry crown borer. Chemical control consists of directing sprays of carbaryl (Sevin), malathion or methoxychlor at the plants and surrounding soil to kill adults before the eggs are deposited. Apply when adult activity is observed (usually in mid-May) and repeated at 7- to 10-day intervals until adult emergence stops (usually by early July).

Adults can also become a nuisance when they move into homes in late summer and early fall. Recommendations listed in NebGuide *G77-342, Sowbugs and Pillbugs*, for controlling migrations of sowbugs and pillbugs should suffice for root weevils.

Wireworms and White Grubs

Adult wireworms (click beetles) and white grubs (June beetles and masked chafers) do not generally deposit eggs in cultivated soil. As a result, most problems with these insects in strawberries occur the first few years out of sod.

Wireworm adults are elongate, slender, hard-shelled beetles that take their name from their habit of flipping into the air with a noticeable clicking sound when they are placed on their backs. Depending on the species, size varies from about 1/4 to 1 1/4 inches and color from tan to black. Larvae of various species may be hard, brown, smooth and wire-like, or soft and white with yellowish-brown heads and tails. Larvae associated with strawberries generally range from 3/8 to 1 inch when fully grown. Eggs are deposited in the soil and hatch in a few days to a few weeks. Larvae feed on the roots and crowns of various plants. Up to 5 years may be required to reach maturity, depending on the species. Winter is spent in the soil as larvae or adults, with new adults emerging in the spring. Refer to NebGuide *G92-1085, White Grubs in Turf*, for descriptions and life history information on white grubs.

Damage from wireworms and white grubs results from larval feeding on the root systems which causes weakened or dead plants.

Control. If possible, avoid planting strawberries in soil that has recently been in sod. Clean cultivation of the garden area may reduce its attractiveness to egg-laying adults.

There are no registered materials available to the homeowner for wireworm or white grub control in strawberries. However, if transplanting into infested soil cannot be avoided, diazinon 5G at 4 oz., 14G at 1.3 oz., or 25 EC at 3/4 fl. oz./500 sq. ft. applied before planting, as directed on the label for control of mole

crickets, may reduce the injury associated with wireworms and white grubs. Postplant applications of insecticides are not likely to be effective due to the inability of the product to reach the root zone.

Foliage Feeders

Strawberry Leafroller

Ancylis comptana fragariae (Walsh Riley)

Adult leafrollers are small (about 1/2 inch wingspan), reddish-brown moths with brown and yellow to white bands on the wings. They deposit eggs on the undersides of leaves in early to late May that hatch in about a week. Larvae are green to brown in color and feed initially on the undersides of leaves beneath a silken covering. When about half grown, the caterpillar moves to the upper surface, folds the leaf around itself, continues feeding until full grown (1/2 inch or more in length), and pupates in the rolled leaf. Adults emerge to start a second generation in late June to early July. Winter is passed as pupae in rolled leaves or as larvae under surface debris. Infested leaves turn brown and die. Heavily infested beds take on a grayish cast accompanied by the production of withered and deformed fruit.

Control. Control with sprays of diazinon, carbaryl (Sevin) or malathion. Best results are obtained when sprays are applied before the leaves are rolled, with sufficient pressure to thoroughly cover the undersides of the leaves.

Twospotted Spider mite *Tetranychus urticae* Koch

Spider mites are not insects, but are more closely related to ticks and spiders. Mites feed by sucking fluids from the plants and generally occur in highest numbers on the undersides of leaves. Heavily infested leaves may be covered with fine, irregular webs in which mites, eggs, and shed skins are suspended appearing as dust particles.

Warm, dry weather tends to favor rapid mite development and reproduction, enabling them to complete a generation in as little as 5 to 7 days. Infestations are usually most severe in late summer and early fall. Damage symptoms progress from stippling, yellowing, wilting, and browning, and eventually to death of the leaves or whole plant. In addition to crawling, mites can be spread by wind currents and by people or animals moving through the bed.

Control. Recommended controls include sprays of dicofol (Kelthane), diazinon or malathion applied with sufficient pressure to thoroughly cover the undersides of the leaves. Treatments will be ineffective unless mites are contacted. Repeated applications, spaced 7 to 10 days apart, may be required to achieve control.

Field Crickets and Grasshoppers

Most species of crickets and grasshoppers overwinter as eggs in the soil, hatch in May and June, and mature in August and September.

Injury to strawberries can occur any time between egg hatch and frost in the fall. Damage is generally most severe in late summer and early fall as the insects move into gardens from surrounding lawns, fields and weedy areas. Immatures (nymphs) and adults will feed on all above-ground portions of the plant.

Control. Reduction of grasshopper and cricket infestations can be obtained with broadcast applications of carbaryl (Sevin) 5% bait or foliar sprays of diazinon, carbaryl (Sevin) or malathion. If significant migration from surrounding areas is occurring, reapplying the insecticide may be necessary to protect the strawberries. Control is enhanced if infested border areas are also treated. Check the pesticide label to be sure the product may be applied to the specific border site(s).

Fruit Feeders and Miscellaneous Pests

Sap Beetles

Adult sap beetles are small, compact, hard-shelled beetles ranging in size from about 1/16 to 1/2 inch. Most species are brown, black, or black with four yellow or orange spots. The wing covers are short, leaving the tip of the abdomen exposed. Larvae are small, white to brown, and soft-bodied, and may have small fingerlike projections along each side of the body. Adults are attracted to ripe, damaged, fermenting or decaying plant material. Both adults and larvae feed in such material.

Injury to strawberries is restricted to ripe or overripe berries, which are partially or completely consumed by these insects. Berries that have been damaged and are oozing fluids are most attractive to the beetles.

Control. Timely harvesting of fruit will often prevent most of the injury caused by these pests. If chemical control is required, pick any ripe berries first, and then apply a spray containing malathion, carbaryl (Sevin) or diazinon.

Sowbugs and Pillbugs

These pests are crustaceans and are more closely related to shrimp, crabs, and crayfish than to insects. Adults are oblong, hard-shelled, brown to gray in color, and resemble small armadillos. They are about 3/5 inch long when full grown. Pillbugs are capable of rolling themselves up into a tight ball when disturbed; sowbugs cannot. Immatures resemble small adults. Winter is passed in debris and sheltered areas as inactive adults and immatures. In the spring, females deposit 7 to 200 eggs in a pouch on the underside of their bodies. Eggs hatch in 3 to 7 weeks and the young may stay in the pouch for up to 6 weeks after hatching. There are usually two generations produced each year and individuals can live up to 3 years.

Sowbugs and pillbugs have high moisture requirements. They normally feed on organic matter and often develop high populations in mulches, grass clippings, leaf litter and soils high in humus. They will also feed on tender roots and stems of various plants as well as soft fruits in contact with the soil, including strawberries.

Control. Removing moisture sources and excess mulches will prevent rapid buildup of these pests. Picking berries before they become overripe will reduce damage to fruit. If chemical control is required, broadcasting carbaryl (Sevin) 5% bait or applying sprays containing malathion, carbaryl (Sevin) or diazinon to the soil should reduce the problem.

Sowbugs and pillbugs sometimes enter homes in the fall. While they cause no damage in the home, their presence is resented by most home owners. Refer to NebGuide G77-342 for information on control of sowbugs and pillbugs as household pests.

Millipedes

Adults of the common species are elongate, 1 to 2 inches long, slender, hard-shelled, dark reddish-brown, and have numerous body segments. Most body segments have two pairs of legs. The total number of segments varies according to age and species. Millipedes overwinter as adults and immatures in debris and sheltered areas. In the spring, adult females deposit up to 300 eggs in the soil and these hatch in about 3 weeks. Young resemble adults but are smaller, have fewer segments, and only three pairs of legs. As they grow they shed their skins several times, with additional segments and legs added at each molt. It takes 1 to 5 years to reach maturity and individuals may live for several years after that. Usually only one generation is produced each year. Many species are capable of producing an unpleasant odor when threatened and some also coil up when disturbed.

Food sources, environmental requirements, damage to strawberries, and the tendency to migrate into structures are similar to those of sowbugs and pillbugs. Cultural and chemical controls listed for sowbugs and pillbugs will also reduce problems associated with millipedes.

Slugs

Slugs are, for all practical purposes, merely snails without shells. Species associated with strawberries are gray and about 1 inch long when fully grown. Immatures resemble small adults. Winter is spent as immatures or adults in sheltered areas or in the egg stage. Eggs are laid in masses of 25 or more in moist places from spring to fall. The eggs hatch in about a month if temperature and humidity are favorable. Most species mature within a year.

Slugs are very susceptible to desiccation (drying) and require very moist, shady conditions. They feed in the evening or on cloudy days and remain hidden on sunny days. They will feed on virtually any organic material they can ingest, including young seedlings and succulent portions of plants. Damage to strawberries consists of large, irregular areas eaten from leaves and berries.

Control. Thinning the plants in the bed to open the canopy and dry the soil will deter slugs to some extent. Removing mulch and reduced watering are also helpful. Slugs can be trapped by placing boards on the ground in the bed. Those that accumulate under the boards can be removed each morning and disposed of. If chemical control is required, a bait containing metaldehyde (Bug-Geta®) can be broadcast on the soil surface surrounding the plants (mesurol baits such as SlugGeta® cannot be used in gardens). Take care not to contaminate the edible portions of the plants. Lightly water bait after application to increase its attractiveness. Insecticides are generally not effective in controlling slugs.

Tarnished Plant Bug

***Lygus lineolaris* (Palisot de Beauvois)**

Adults of this species are soft-bodied, somewhat flattened, elongate-oval bugs about 1/4 inch long. The body is usually brown and mottled with varying amounts of black, white, yellow and/or green. Eggs are inserted in various plant structures and hatch in 7 to 10 days. Nymphs are greenish-yellow with 5 black spots on the back. A generation is usually completed in 3 to 5 weeks. Adults overwinter in sheltered areas and become active in early spring. Damage to strawberries is caused by nymphs and adults sucking fluids from buds and fruits, resulting in infertile flowers or hard, misshapen, partially ripe berries. There are several related species, collectively referred to as lygus bugs, that are similar in appearance, habits, and the damage they cause to strawberries.

Control. Spray with malathion when adults appear in the spring and repeat after bloom if required.

Recommended pesticides

pesticides should never be applied unless it is known that the pest is present in damaging numbers and all other practical control alternatives have been attempted. Unnecessary pesticide applications are expensive, time consuming, sometimes impose harvest restrictions, and may needlessly damage beneficial organisms. If possible, avoid applying insecticides during bloom in order to prevent injury to pollinators. If you must treat during bloom, do so only in the evening after honeybee activity has decreased. When applying any pesticide, read and follow all label directions.

Product & Formulation	Rate	Harvest & Other Restrictions
carbaryl 50% WP (Sevin)	2-4 Tbl./gal.	1 day
carbaryl 5% Bait	15 oz./1000 sq. ft.	1 day
diazinon 25% EC	2 tsp./gal.	5 days
dicofol 18.5% EC (Kelthane)	1 1/3 Tbl./gal.	2 days
malathion 50% EC	2 tsp./gal.	3 days
metaldehyde 3.25% Bait (Bug-Geta)	1 lb./1000 sq. ft.	Do not contaminate edible portions of plant. Bait may be attractive to dogs. Confine pets during application.
methoxychlor 50% WP	2-3 Tbl./gal.	14 days.
ABBREVIATIONS USED: G=granule; WP=wettable powder; EC=emulsifiable concentrate; Tbl=tablespoon; tsp=teaspoon; oz=ounces; gal=gallon; lb=pound; sq. ft.=square feet.		

For additional information on specific pests, refer to the following NebGuides, available from the Cooperative Extension Service office in your county:

- G86-791 *A Guide to Grasshopper Control*
- G77-342 *Sowbugs and Pillbugs*
- G80-486 *Crickets*
- G92-1085 *White Grubs in Turf*

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