COOPERATIVE EXTENSION SERVICE, MICHIGAN STATE UNIVERSITY
Extension Bulletin E-959, May 1983

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Common Asparagus Pests

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The first step in pest management is to accurately identify the pest and associated symptoms. Knowledge of the status of your pests, weather data, crop development, and management techniques will allow you to make the best possible control decisions.

It is necessary to keep close track of the times of appearance of pests and their numbers. If you can accurately identify the pest and report a few things about them to extension personnel or crop consultants, it will greatly increase the chances for successful pest control. This bulletin is intended as a guide to help you identify the major asparagus pests. The latest control recommendations for these pests may be obtained through your local Cooperative Extension Service Office.

Disease Pests

Asparagus rust and crown rot are the two most important fungal diseases of asparagus in Michigan. Although the asparagus rust fungus can attack all aboveground parts, damage is most severe when fern tops are attacked several years in succession. This results in reduced vigor of the root system so that in the coming year only cull shoots are produced or the entire plant dies.

The rust fungus must produce several spore stages to complete its life cycle. Aecial lesions appear during spring and early summer. Uredial lesions appear in mid to late summer and are followed by the telial stage in late summer.

Purple spot disease may appear on spears during harvest time. The small purplish lesions are caused by a fungus which enters through small wounds such as those caused by blowing sand. Lesions may also appear on ferns after harvest, reducing plant vigor.

Asparagus crown rot is caused by two related species of the soil borne fungus *Fusarium*. Incidence of asparagus crown rot increases when plants are produced under less than ideal conditions. Certain cultivation practices and insect injuries contribute to crown rot development.

Fusarium Crown Rot

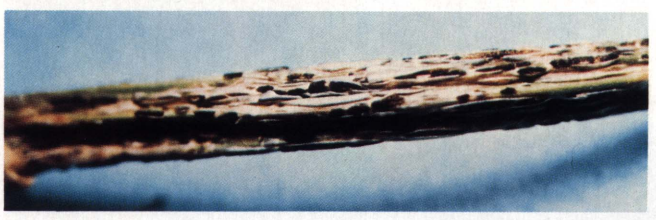
Plants affected with crown rot may become wilted, dwarfed, yellowish to a dingy brown in color. Internal browning may also occur. On mature plants, a distinct wilt occurs which is most noticeable in the hot months of July and August. Destruction can become widespread, but generally affected plants are scattered among healthy plants.

Affected plants exhibit a dark or sometimes reddish color on the outer part of the root which finally involves the entire crown as well as the below-ground stem. Rotted storage roots become hollow and limp. The entire crown may eventually die.

Asparagus Rust

Aecial lesions are oval, light orange in color, at first raised, with lesion centers becoming sunken as the lesions age. This is the first rust spore stage that occurs in the spring. Lesions of another fungus (*Ascochyta spp.*) often occur at the same time, and may even occur in the identical spot with rust lesions. *Aschochyta* may be identified by the small, black, bodies about the size of a period in the lesions called pycnidia.

The uredial stage consists of reddish brown spores that erupt from beneath the host epidermis. The uredial stage can become visibly very noticeable and is the stage that does the most damage to the asparagus plant. Uredia may be formed as early as June and as late as September.



Those uredia that develop in late summer give rise to the black telial (overwintering) stage. Both the uredial and telial stages may be seen in the same lesion in August - September.

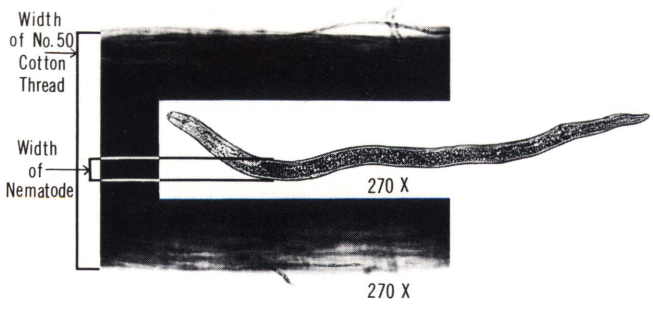
Stemphyllium Purple Spot

A fungus called *Stemphyllium vesicarium* can sometimes cause small purple spots, often in great numbers, on spears ready to be harvested (left). Wounds (such as those caused by blowing sand) are necessary before the fungus can infect. If spores of the fungus are present, the spears have been wounded, and a dew or rain occurs, purple spot may be found on spears at harvest. In the fern, this fungus may cause large, elongate, tan lesions with dark borders (right).

Nematode Pests

Plant parasitic nematodes are not known to be pests of major economic significance in Michigan asparagus production. Relatively little, however, is known about asparagus-nematode relationships. Surveys of Michigan asparagus plantings have shown that although the root-lesion nematode (***Pratylenchus penetrans***) is frequently present in young plantings, it is rarely found in plantings more than 10 years old. MSU greenhouse research shows that population densities of the root-lesion nematode declined during the first 5 years after planting asparagus. It is possible, however, that the root-lesion nematode could be an important predisposition agent associated with ***Fusarium*** problems of asparagus. Rootknot nematodes (***Meloidogyne*** spp.) have caused problems in asparagus production in some regions outside Michigan. It has been known since 1958 (U. of Maryland) that asparagus roots secrete a chemical exudate that is toxic to the stubby-root nematode (Trichodorinae).

New asparagus sites, locations to be replanted, and crown beds should be sampled for nematodes prior to planting to determine if population densities are high enough to be a potential problem. Because of the long-term nature of asparagus plantings, information of this type is essential for optimal decision-making. Soil and root samples for nematode analysis can be sent to a number of private laboratories, or the Nematode Diagnostic Service Laboratory at Michigan State University. MSU Extension Bulletin E-800 has more on nematode sampling.



Female nematode and cotton thread photographed at the same magnification. Though the nematode is nearly twice as long as the thread is wide, it is so narrow (1/15 the diameter of the thread) that it is not visible to the naked eye. Photo: H.H. Lyon and W.F. Mai (Cornell University).

Insect Pests

Common insect pests of asparagus in Michigan are cutworms, asparagus beetles, plant bugs, asparagus aphid, and asparagus miner. The asparagus miner does not directly damage the plant, although it may provide entry sites for disease organisms.

Cutworms

Several species of cutworms feed on asparagus spears in Michigan. The most common species are the white cutworm and the dark-sided cutworm. Both species are general feeders and occur on a wide variety of crops and weeds. White cutworms overwinter as ¾ grown (½-¾" long) larvae, damaging spears from the beginning of the season until late May or early June. Damage is somewhat more common in no-till than in fields routinely tilled. White cutworms feed on the growing tip of the asparagus spear, but also feed readily on the butts of previously harvested spears. Since spear growth is slow and few butts are present early in the season, the most severe damage occurs at this time. Larvae pupate in the soil. Adults, 1" long, gray to brown moths, are active from late June through mid-August and lay eggs on the soil in a wide variety of habitats, although sandy soil is preferred. The eggs hatch in August and larvae feed on weeds, volunteer asparagus plants, etc., during the fall. Larvae can be easily detected in late September or October if they are present in potentially damaging numbers. Up to 80 or 90% of the larvae may die over the winter, depending on factors such as snow cover and tillage practices.

Dark-sided cutworms overwinter in the egg stage. Eggs hatch in April and damage to asparagus may occur from May through the end of the harvest season. Larvae feed on the sides of the spears above or just below the soil surface, causing distorted spear growth. Larvae pupate in the soil during July or early August and the adults are active and laying eggs from mid-August through October.

Adult cutworms are highly migratory, moving in and out of fields on a daily (nightly) basis, so control measures must be directed at larvae.

Asparagus Aphids

The European asparagus aphid is a major pest of asparagus in the state of Washington. However, it does not generally build up to damaging numbers in Michigan fields. Asparagus aphids overwinter as pinhead-size black eggs on the asparagus fern or soil surface. The eggs hatch in early spring and the aphids feed and reproduce rapidly on asparagus fern or volunteer seedlings. All asparagus aphids present during the growing season are females that produce live female young without mating. Adults may be winged or wingless, depending partly on the food quality and the density of the colony. A generation of winged males and females occurs in the fall, in response to short day length, mating occurs, and the overwintering eggs are laid.

The aphids feed by sucking plant juices. There appears to be a toxic reaction, causing bushy, stunted new growth (bonsai growth) and a bluish-green color to the new fern. Small plants, in particular, can even be killed by extremely high aphid populations.

In producing fields, spears are harvested so frequently that aphids can neither mature nor begin to reproduce on the spears. Within a few weeks after the beginning of harvest, the remaining aphids are present only on volunteer seedlings. In non-producing (young or abandoned) fields, aphids have ample food available and may reach significant numbers by late June or July. Fields 1-2 years after transplanting are the most susceptible to damage. The plants are still small and the aphids can become established early in the season, since overwintering eggs may be present and the early growth is not being harvested.

Aphids are heavily attacked by predators (lady beetles, lacewing larvae, spiders, etc.), tiny parasitic wasps, and insect-specific diseases. Because of these and other mortality factors, aphids in Michigan rarely reach damaging numbers.

Asparagus Beetles

The common asparagus beetle overwinters as an adult and emerges in April, earlier than the spotted asparagus beetle, and begins feeding and laying eggs on the spears. Spotted asparagus beetle adults may feed on spears, but do not begin laying eggs until plants are ferned out and berries are forming. Adults of both species and larvae of the common asparagus beetle can sometimes cause severe damage to fern growth.

Plant Bugs

Tarnished and alfalfa plant bugs can cause severe "tip dieback" injury to asparagus. They overwinter as adults and emerge in April or May. The first generation usually occurs on alfalfa or weeds, although damage may occur to asparagus spears during harvest. During July and early August, as hay is cut and weeds mature and dry out, plant bug adults migrate to many alternate hosts, including asparagus. Adults and nymphs feed by inserting sucking mouthparts into the plant tissue, injecting salivary enzymes, and sucking plant juices. The salivary enzymes are toxic to asparagus and cause a collapse of the conductive tissue and death of the plant above the point of injury (tip dieback). Only spears or partially mature ferns show tip dieback symptoms. There are apparently no long-term toxic effects of plant bug feeding, but foliage loss can be severe. Plant bug adults are highly migratory and susceptible stages of plant growth may occur in spurts, so timing of treatment is critical.

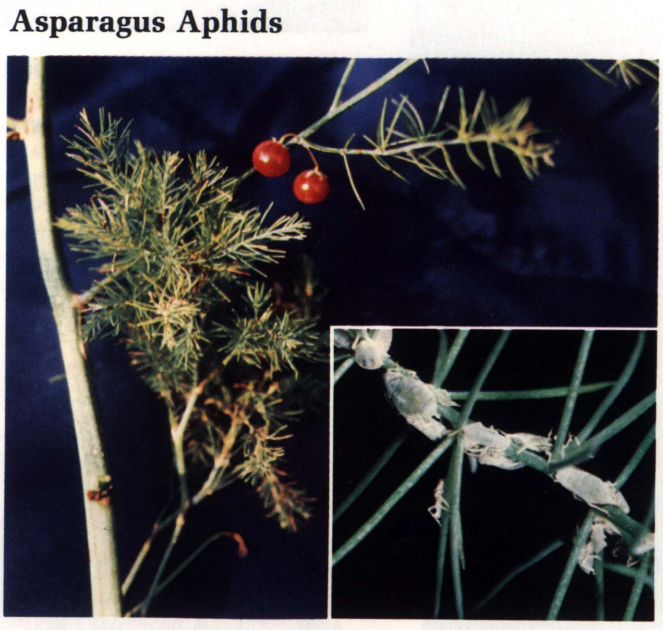
Asparagus Miner

There are 2 generations of asparagus miner each year. The adult fly appears in the field near the end of May giving rise to egg, larval and pupal stages, each of which lasts for about 3 weeks. Adults are small, 1/6 inch (4 mm) long, black and shiny two-winged flies.

Cutworms

White cutworm (left) and dark-sided cutworm (right) and typical damage.

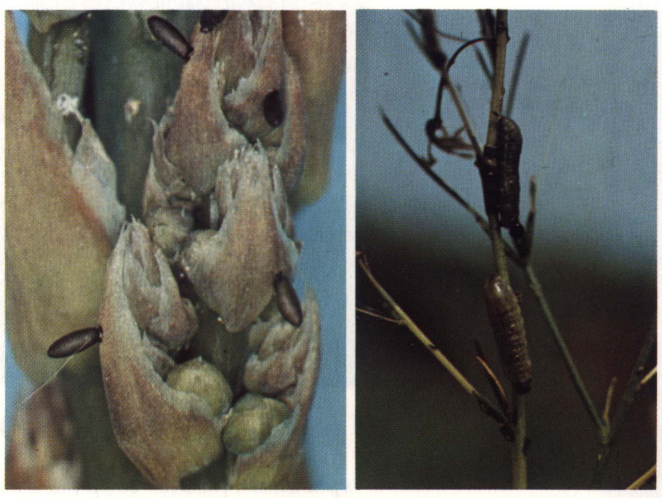
Asparagus Aphids



European asparagus aphids (inset) and typical damage (right). Large numbers of aphids can cause stunted, bushy new growth (bonsai or witch's broom), and often a bluish-green color to the fern.

Asparagus Beetles

Common asparagus beetle (left) and spotted asparagus beetle (right). The common asparagus beetle occurs earlier in the season and is the more damaging species. Larvae of the spotted asparagus beetle feed on the berries rather than the fern.



Common asparagus beetle eggs (left) are dark brown, 1/16 inch long, laid on end on spears or fern beginning in April or May. Larvae (right) are gray, slug-like, with black heads and legs. Larvae feed on spears or fern and pupate in the soil.

Plant Bugs

Tarnished plant bug and tip dieback injury. Tarnished and alfalfa plant bugs feed on new growth, damaging conductive tissue and causing tip dieback. Injury may not be apparent for several days after feeding. Damage is most common during summer flushes of new fern growth in late July or August.

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Issued in furtherance of cooperative extension work in agriculture and home economics, acts of May 8, and June 30, 1914, in cooperation with the U.S. Department of Agriculture. Gordon E. Guyer, Director, Cooperative Extension Service, Michigan State University, E. Lansing, MI 48824.

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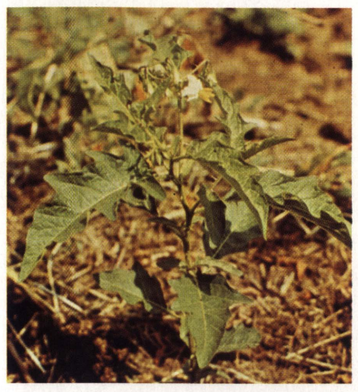
Weed Pests of Asparagus

Weeds cause losses in asparagus not only by using nutrients and water, but some may produce toxic substances that inhibit asparagus growth, some harbor insects and diseases, and others interfere with harvesting. Weed competition is most damaging to asparagus in mid to late summer when the fern is producing reserve food for next year's crop. Under dry conditions, competition for water is particularly acute.

PERENNIAL WEEDS

Perennials live for more than two years and may live indefinitely, and in that respect are similar to asparagus. They have become a more serious problem with the improved control of annual weeds using pre-emergence herbicides. Perennial weeds reproduce and spread in fields by vegetative methods. They may be divided into broadleaved plants and grasses or sedges.

Horsenettle



Leaves are alternate, wavy edged or lobed with rough yellow spines. Stems are 1 to 4 feet tall (3 to 12 dm), also with spines. Flowers are borne in clusters and are white to purple, about ¾ inch (1.9 cm) across. The fruits are about ½ inch (1.3 cm) in diameter and resemble a tomato in shape.

Field Bindweed

Leaves are alternate on long twining stems and are shaped like an arrowhead. Roots may extend several feet into the soil with new shoots emerging from them. Flowers are funnel shaped, white to pink and about 1 inch (2.5 cm) across. This plant is often called wild morning glory.

Common Milkweed

Leaves are opposite and oval shaped, 4 to 8 inches (10 to 20 cm) long with prominent veins. The upper surface is smooth and the lower surface downy. Stems may be 2 to 5 feet (6 to 15 dm) tall, producing pink star-shaped flowers in clusters. Spiny seed pods are green to gray and 2 to 4 inches (5 to 10 cm) long. The thick fleshy roots may extend several feet in the soil.

Swamp Smartweed

Leaves are alternate, narrow and pointed, with a sheath enclosing the base. Stems are 1 to 3 feet (3 to 9 dm) tall from an extensive woody rhizome. Flowers are pink, and produced in a dense spike 1 to 3 inches (2.5 to 2.6 cm) long.

Northern Dewberry

Leaves are compound with 3 to 5 leaflets. Stems are woody, prostrate to arching with thorns. Flowers are white to pink producing black edible fruits. Roots spread several feet deep. Reproduces both by seed and by stems that root at the tips.

Quackgrass

A perennial grass which spreads by seeds and rhizomes. It suppresses crops by competition and by releasing a toxic substance. Tillage often spreads this weed because each of the cut rhizomes can produce a new plant.

(Left) Quackgrass leaves can be identified by a clasping auricle which wraps around the leaf sheath at the base of the leaf blade. Leaves also have a prominent ribbing.

(Right) The flower head of quackgrass is a spike. It is unique and easy to distinguish from that of other grassy weeds.

Yellow Nutsedge

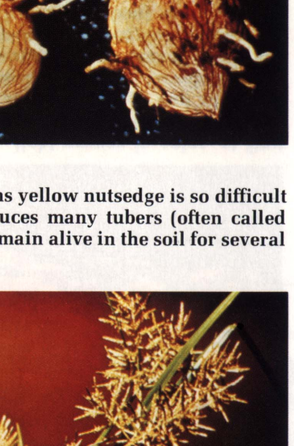
Leaves are a shiny light green color arising from a triangular stem. The plant grows ½ to 2 feet (1.5 to 6 dm) tall and is more common on moist than dry soils.

One of the major reasons yellow nutsedge is so difficult to control is that it produces many tubers (often called nuts). These tubers can remain alive in the soil for several years.

Yellow nutsedge produces yellowish to yellowish-brown flowers in narrow spikelets. The seed are yellowish brown, 3-angled, about 1/16 inch (1.5 mm) long. Seed could be an important means of spread from field to field.

Field Horsetail

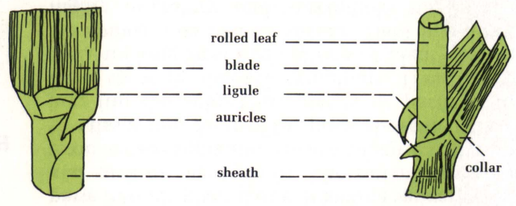
Leaves somewhat resemble the fern of young asparagus seedlings. This perennial reproduces by rhizomes to which are attached small tubers. It also produces tan-colored shoots that terminate in a spore-producing fruiting body. Usually found in poorly drained areas.



ANNUAL WEEDS

Annual weeds complete their life cycle from seed to seed in one season. Most of the problem annual weeds in asparagus germinate during the spring and summer. They may be divided into two classes, grasses or broadleaved weeds. Grasses are difficult to tell apart until they reach the flowering stage. When in the seedling stage, grasses may be identified by their leaf characteristics, in particular by that part of the leaf called the ligule. The major parts of grass leaves:

GRASS LEAVES



Crabgrass

There are two types of crabgrass found in Michigan asparagus fields. Smooth crabgrass (above, left) usually has none or only a few hairs on the leaf blades. Large or hairy crabgrass (right) has many hairs on the leaf blade and sheath. Both plants have a membrane-like ligule. This grass usually lays close to the ground.

The flower heads of crabgrass are easily distinguished from other grasses. They are divided into 3 to 10 segments in a finger-like arrangement. Crabgrass does not germinate until soils have warmed up in early June.

Barnyardgrass

(Left) Seedlings of barnyardgrass can easily be distinguished from other grasses because their leaves have no ligules and both the leaf blades and sheaths have no hairs. This grass grows upright, but may spread if not crowded.

(Right) The seedhead of barnyardgrass is also easily recognized. It is a branched panicle and the flowers are covered with short stiff bristles. This seedhead may be green or purplish in color.

Fall Panicum

Yellow Foxtail

(Left) Yellow foxtail is one of several problem weeds in the foxtail family. The ligule is a fringe of very short hairs. A tuft of long hair at the base of the leaf blade characterizes this species. The remainder of the leaf blade is smooth or sparsely hairy. The leaves are often twisted in appearance.

(Right) The foxtails were obviously named for the appearance of their seedheads. The plants grow 1 to 2 feet tall and may produce several seedheads.

Field Sandbur

Sandburs are one of the most unpleasant weeds in asparagus fields because of the sharp, spiny burs which cling to clothing and may puncture the skin. Sandburs germinate during the harvest period and produce light-green, smooth leaves. The ligule is a conspicuous ring of white hairs. The leaves are sharp pointed and may become twisted as they get older. They are most common on sandy fields close to lake Michigan.

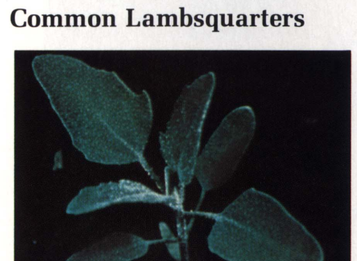
Stinkgrass

This grass is most prevalent in Southwestern Michigan. The leaves are narrower than any of the other grasses commonly found in asparagus. The ligule is a fringe of hairs. Leaf blades are smooth on the underside and may have a few hairs on the upper side. The seedheads are branched panicles with flat, gray-green-to-purple spikelets.

Redroot Pigweed

Pigweed is a broadleaved annual that is common in asparagus fields. Seedlings may be identified by the reddish stem, root, and new leaves. Plants may grow up to 6 feet tall and use large amounts of nutrients and water.

Common Lambsquarters



This broadleaved annual can be recognized by its distinct gray-green color and mealy-coated leaves. Like pigweed, it is a severe competitor with crops. It often grows to a height of 3 to 4 feet.

(Left) This weed has become much more prevalent in no-tillage fields. Seedlings can be identified by the ligule which is a dense fringe of short hairs. The leaf blades are smooth to sparsely hairy. This grass may reach a height of 4 feet with coarse stems.

(Right) The seedhead of fall panicum is a fine-branched panicle, usually purplish in color. This weed germinates in mid-season and produces seed in the fall. It is a vigorous competitor with asparagus fern growth.