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'ADELGIDS': The Aphid Controversy

By DR. R. LEE CAMPBELL
Associate Entomologist
Western Washington Research
and Extension Center
Puyallup, WA

PINE BARK aphid, eastern spruce gall aphid, balsam woolly aphid — these and other insects in the subfamily Adelginae have been given names which include the word 'aphid.' They are not very much like true aphids but are more closely related to the grape phylloxera which devastated the French vineyards in the latter part of the nineteenth century.

Generally, names, as such, are unimportant but in this case they have led to misunderstanding and resultant economic loss. Perhaps a change is in order. I propose to call them 'adelgids.'

The problem is that the physiology of the adelgids differs from that of aphids and, as a result, insecticides which are very effective in controlling aphids are often useless against adelgids. However, since they are stuck with the name and most people do not know their idiosyncrasies, many who try to combat them with aphicides are disappointed with the results. In general, organophosphate insecticides, such as malathion, are used for aphid control but are not effective against adelgids, while carbamates, such as carbaryl, are excellent for adelgid control and not very effective against most aphids. Endosulfan, a chlorinated insecticide, is an example which is effective in control of both aphids and adelgids.

The adelgids are an extremely in-

(continued on page 58)
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Turfgrass Nematode Problems: Diagnosis and Control

By DR. G. W. BIRD*

PLANT PARASITIC nematodes are microscopic worms that usually feed on the roots of plants. In Michigan, they can be severe pests of turfgrasses.

Above-ground symptoms of nematode-infested turf include yellowing of leaves, dieback and breakdown of young foliage and a tendency to wilt during periods of high temperature and low moisture. Grass cover generally becomes thin and growth during the summer months is poor. Severely affected areas may become bare and infested by annual grasses and weeds. In addition to causing direct damage to root systems, feeding by some plant parasitic nematodes increases susceptibility of certain turfgrasses to diseases caused by other organisms.

Some nematodes live and feed within the roots of turfgrasses. Others live in the soil and feed on the root surface. Both types migrate through the soil from root to root and can be moved even longer distances in sod, irrigation water or in soil on mechanical equipment.

Stunt, stubby-root, root-knot and cyst nematodes are the four most important nematode pests in Michigan turfgrasses. High population densities of the stunt nematode appear to be very commonly associated with Michigan turfgrasses. Spiral, ring and sheath nematodes are also frequently recovered in high numbers from Michigan turfgrasses; however, their overall influence on plant growth and development is unknown.

In Michigan, typical symptoms of Fusarium blight of Merion Kentucky bluegrass usually occur only in the presence of both stunt nematodes and the fungus Fusarium roseum. The stunt nematode renders this grass susceptible to the fungus and appears to be the dominant causal agent in this disease complex.

Nematode Detection

Because nematodes are microscopic and the damage they cause is very similar to that resulting from other factors, a laboratory analysis of soil and root tissue is usually necessary for diagnosis of plant parasitic nematode problems. In Michigan, this service is provided by the Michigan State University Nematode Diagnostic Service Laboratory, which is operated under the direction of the Michigan Cooperative Extension Service.

Turf samples should be taken with a soil sampling tube, trowel or narrow-bladed shovel. The soil should be taken at a one- to five-inch depth, and contain as many feeder roots as possible. Each sample should consist of a pint to a quart of soil taken from a larger sample composed of 10 or more subsamples. The number of subsamples (soil cores or borings) needed depends on the size of the area being investigated. The subsamples should be mixed in a clean pail or a plastic bag and one pint to a quart submitted for nematode analysis.

Plant parasitic nematodes feed only on living tissues and are rarely found in dead roots. Soil and root samples, therefore, should be taken from the margin of the problem area where the turfgrass is still living.

Sod farm acreage should be sampled for nematodes before seeding. In the production of sod, commercial turfs and private lawns, it is much easier to prevent the occurrence of nematode problems than to alleviate them once present.

Pre-seeding treatment — If a site is infested with a detrimental plant parasitic nematode, pre-seeding treatment with an appropriate soil fumigant or nematicide is frequently recommended. This type of nematode control is generally more satisfactory than treatment at or after seeding. Pre-plant soil fumigants such as DBCP, 1,3-D or 1,3-D plus chloropicrin are all suitable for nematode control. The amount of chemical required in organic soil is usually approximately twice that needed for mineral soil. Soil fumigants should be injected into the soil and applied at least 21 days before planting. The soil temperatures should be between 50 and 80 degrees F. Prior to seeding, the soil must be worked to release the fumigant.

Treatment of established sod — DBCP is the only soil fumigant that can be used for nematode control in established sod. To insure good penetration of the chemical, it must be applied as a drench.

*The author is a nematologist in the Department of Entomology and the Department of Botany and Plant Pathology, Michigan State University.

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The granular nematicides Fen- 
sulfothion and Phenamophos can be 
used to control nematodes in es-
lished sod. They must be uni-
formly distributed over the area to 
be treated and drenched immedi-
ately after application. The sod 
should not be harvested for at least 
60 days after application. Fensulfo-
thion and Phenamophos are for pro-
fessional application only.

Commercial Turf Control

Sites to be used for the estab-
lishment of high quality com-
mercial turfs should be sampled for 
nematodes before seeding or sod-
ding. If sod is to be used, it is best to 
обtain a high quality product grown 
in nematode-free, nematicide-
treated or fumigated soil. This pre-
caution, however, will be of little 
value unless the soil where the sod is 
to be used is nematode-free, nema-
ticide-treated or fumigated.

Pre-plant treatment — If a site is 
infested with a detrimental plant 
parasitic nematode, preplant treat-
ment with an appropriate soil fumi-
gant is frequently recommended. 
This type of control is generally 
more satisfactory than treatment at 
or after seeding or sodding.

Treatment of established home 
lawns — DBCP is the only com-
pound recommended for nematode 
control in established home lawns. 
It must be applied by a professional 
applicator, and to insure good 
chemical penetration, it should be 
used as a drench.

Home Lawn Control

Sites to be used for the estab-
lishment of high quality home lawns 
should be sampled for nematodes 
before seeding or sodding. If sod is 
to be used, again it is best to obtain 
a high quality product grown in 
nematode-free, nematicide-treated 
or fumigated soil, providing the soil 
where the sod is to be used is nema-
tode-free, nematicide-treated or 
fumigated.

Pre-plant treatment — If a site is 
infested with a detrimental plant 
parasitic nematode, preplant treat-
ment with an appropriate soil fumi-
gant is frequently recommended. 
This type of control is generally 
more satisfactory than treatment at 
or after seeding or sodding.

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Butz, Train Call for Cooperative Effort
In Applicator Training, Certification

EPA Administrator Russell E. Train and Secretary of Agriculture Earl L. Butz have announced the signing of an interagency cooperative agreement calling for Federal, State and local cooperation in the training and certification of pesticides applicators. The agreement will help to implement existing regulations concerning certification of applicators.

"This agreement will provide policy guidelines to regional, State and local agencies to promote the development of applicator training programs, by bringing Federal, State and local resources to bear on this activity," Train said. "These programs will help to insure both that restricted pesticides are used safely and that agricultural productivity is maintained."

"The Department of Agriculture's Extension Service will work closely with EPA to assist the States' Cooperative Extension Services in implementing training programs," said Secretary Butz. "The Extension Service is the basic educational arm of the Department of Agriculture; therefore, its personnel and resources will be a vital part of our cooperative effort to train applicators in the safe use of pesticides."

EPA said applicator certification is a positive effort to insure the safe and proper use of potentially hazardous or environmentally damaging products. The Agency also noted that certification may permit continued use of those products which might otherwise have to be banned since they pose unacceptable hazards to people or the environment unless used by well-trained applicators.

Both Administrator Train and Secretary Butz believe that the training and certification program will help to maintain production while enhancing environmental protection. "We have a natural alliance here," Train said. "The present agreement will do much to lessen the risk of pesticide misuse which might otherwise threaten both of our efforts."

EPA estimates that domestic

(continued on page 42)
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**Meeting Dates**

RCGA and Canadian Golf Superintendents Association, national turfgrass conference and show, Skyline Hotel, Toronto, Ont., March 18-20.

Western Society of Weed Science, annual meeting, Del Webb Townhouse, Phoenix, Ariz., March 18-20.

Canada Chapter, ISTC, annual meeting, Four Seasons Sheraton, Toronto, Ontario, March 19-22.


Southern California Horticulture and Turfgrass Institute, Royal Inn, Anaheim, Calif., April 16-17.

Arizona Turfgrass Council, turfgrass equipment and materials show, Scottsdale Hilton Hotel, Scottsdale, Ariz., April 23.


Western Chapter, ISTC, 42nd annual meeting, Riviera Hotel and Country Club, Palm Springs, Calif., May 11-14.


American Sod Producers Association, summer convention and field days, Crown Center, Kansas City, Mo., July 16-18.


Penn Allied Nursery Trade Show, Hershey Motor Lodge and Convention Center, Hershey, Pa., July 29-31.


Canadian Parks and Recreation Association, annual conference, Quebec City, Quebec, Aug. 10-14.


