

Why Are Plant Parasitic Nematodes Important?

Although plant parasitic nematodes are small, they do have one or more glands that produce substances which, we believe, when introduced into plant cells can cause a number of different effects ranging from a cessation of normal root growth, to abnormal cell enlargement and division, to the death of parasitized and adjacent cells. In addition, waste products excreted by the nematode may cause the same kinds of effects. The majority of nematodes found in Minnesota tend to feed rather superficially on the epidermal and cortical cells of feeder roots. The significance of these nematodes is, at present, often unknown. As mentioned before, several different types of nematodes will invariably enter plant roots. Nematodes of this type with common and descriptive names like "lesion," "root knot," and "cyst" are quite common in Minnesota where they can cause significant losses. These nematodes move through and between root cells causing mechanical and biochemical alteration and damage and often the death of those cells. In addition, the host tissues are altered in such a manner that other pathogens, the fungus that causes Verticillium wilt of potatoes for example, can attack the plant sooner or more severely than that pathogen could if the nematodes were not present.

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Nematodes that deform plant tissues, the root-knot nematode on carrots for example, and nematodes that interact with other pathogens like fungi are likely to be a problem in a given soil every year a susceptible crop is grown. The effects of nematodes that restrict plant root systems will vary in severity from year to year depending upon the environment. During a year when plant growth is not restricted by lack of moisture or other environmental factors, the effects of these nematodes

may be minimal. However, when high temperature and lack of moisture put crop plants under stress, the root rots caused by plant parasitic nematodes may reduce crop yields by 10 to 20 percent or more. Although nematologists have historically expected nematode-caused problems to be most severe on perennial plants growing in light soils, accumulating evidence suggests that nematodes are important on annual crops even in the heavier soils of southern and southwestern Minnesota.

How Can Nematodes Be Controlled?

As stated earlier, since nematodes are very difficult to eliminate it is far better to try to prevent their introduction than to try to cope with them later. In the majority of cases, however, the nematodes are already established. Control of such nematodes often can be achieved by crop rotation and use of chemicals.

Crop rotation is a valuable technique for controlling, or at least minimizing, diseases caused by a variety of soil-inhabiting pathogens like nematodes. Incorporating organic matter and disturbing the soil while preparing the soil for a new and different crop both will tend to reduce nematode populations somewhat. Although many species of nematodes have very wide host ranges, some apparently cannot reproduce on soybeans, others don't reproduce to any extent on wheat, etc. Unfortunately, however, there seem to be some limitations in addition to the more obvious economic and crop preference restrictions that reduce the usefulness of this practice. Certain kinds of nematodes build up on the roots of one crop, overwinter to attack and destroy many of the roots of the next crop even though the nematodes may not be able to reproduce on that crop. Thus, although the rotation will reduce the size of the nematode population, the young plants of the "non-host" crop may be severely damaged.

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The use of halogenated hydrocarbon-type fumigants to destroy 90 to 95 percent of the nematodes in a soil prior to planting the crop has not been as widely accepted in Minnesota as it has in other parts of this country. Time, soil temperature, and cost considerations seriously limit the usefulness of many of these chemicals in cooler areas with a relatively short growing season.

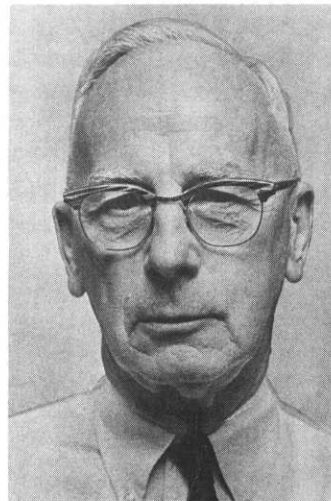
Granular and, to a lesser extent, liquid formulations of insecticides-nematicides are increasingly being registered for use in Minnesota. These materials are applied in the furrow or banded and lightly incorporated in the soil using equipment that is readily available on most Minnesota farms. Usually the application rates necessary to kill nematodes are two to three times those required to control insects. In some cases control has been as complete as that obtained with the use of halogenated hydrocarbons (90 to 95 percent reduction in population).

Since the effects attributable to plant parasitic nematodes are often not specific (a decline in vigor, reduction in yield, tendency to wilt) and the cost of applying even the granular nematicides to a large acreage is definitely appreciable, it is strongly recommended that soil samples be collected and processed for plant parasitic nematodes before any chemicals or other control practices are initiated. Consult Department of Plant Pathology form PL-16 for information about the collection of samples and submission of these samples for processing by the Plant Nematology Laboratory.

Other methods of control less applicable under Minnesota conditions but which may be useful in certain circumstances can be suggested by personnel of the Plant Nematology Laboratory or the Plant Disease Clinic, Department of Plant Pathology, University of Minnesota, St. Paul, MN 55108.

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. Roland H. Abraham, Director of Agricultural Extension Service, University of Minnesota, St. Paul, Minnesota 55108. We offer our programs and facilities to all persons without regard to race, creed, color, sex, age, or national origin.

NECROLOGY



Al Wareham, first Executive Director of M.G.C.S.A. and the founder of HOLE NOTES, passed away on Sunday, February 11 after a long illness. Al was 79 years old.

He served as Executive Director of M.G.C.S.A. from 1968 until 1975. Amateur golf in Minnesota also owes Al a debt of gratitude. He reorganized the Minnesota Golf Association in 1957 and served as its president for three years. In 1961 he became the M.G.A.'s first full time Executive Director and opened the first office. His term as U.S.G.A. Public Links Committeeman in this area stretched 41 years as he attended thirty-three consecutive National Public Links Tournaments. We will all miss Al but the standards he set in all phases of turf and the game of golf will remain behind as his legacy to all of us.

MAY MEETING

Host Superintendent Kurt Erdmann of the Rochester Country Club will have the red carpet out on Tuesday, May 15 for the M.G.C.S.A. monthly meeting. Full details by mail later, but mark your calendar now...especially you straight hitters!



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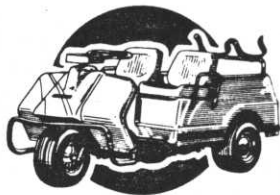
JIM ANDERSON is the newly appointed golf course superintendent at the Lost Spur C.C. in St. Paul. As anxious as everyone is for spring, Jim is doubly so as he has not yet seen the golf course without a thick, white blanket covering it. Prior to joining the staff at Lost Spur, Jim served one year at the Farmers' Golf and Health Club in Sanborn, Minn. and also one year as an assistant at Hazeltine. He received his background in golf course management by completing the University of Minnesota's four year turf program. Although Jim claims there are plenty of things he can do better than his wife, on the golf course he is no match as his wife, Linda, is one of the few women golf professionals in the state.



VERN HANSEN has been employed by the Fargo, North Dakota Park District as golf course superintendent for the past four years. Three different golf courses in the City of Fargo fall under Vern's jurisdiction including the 18-Hole Edgewood Golf Club and two 9-Hole layouts. Previously, Vern had taught at the Anoka Vocational Institute and had worked at the Minneapolis Golf Club after receiving his Bachelor of Science in turf from the University of Minnesota. Vern may hold the record for belonging to the most turf related organizations as he has been a member of M.G.C.S.A. since 1959 and is a member of the G.C.S.A.A., the North Dakota Golf Course Superintendents Association and the Red River Valley Turf Association. Vern and his wife, Sylvia, have two children, David, six and Karla, four and their favorite family hobby is traveling.

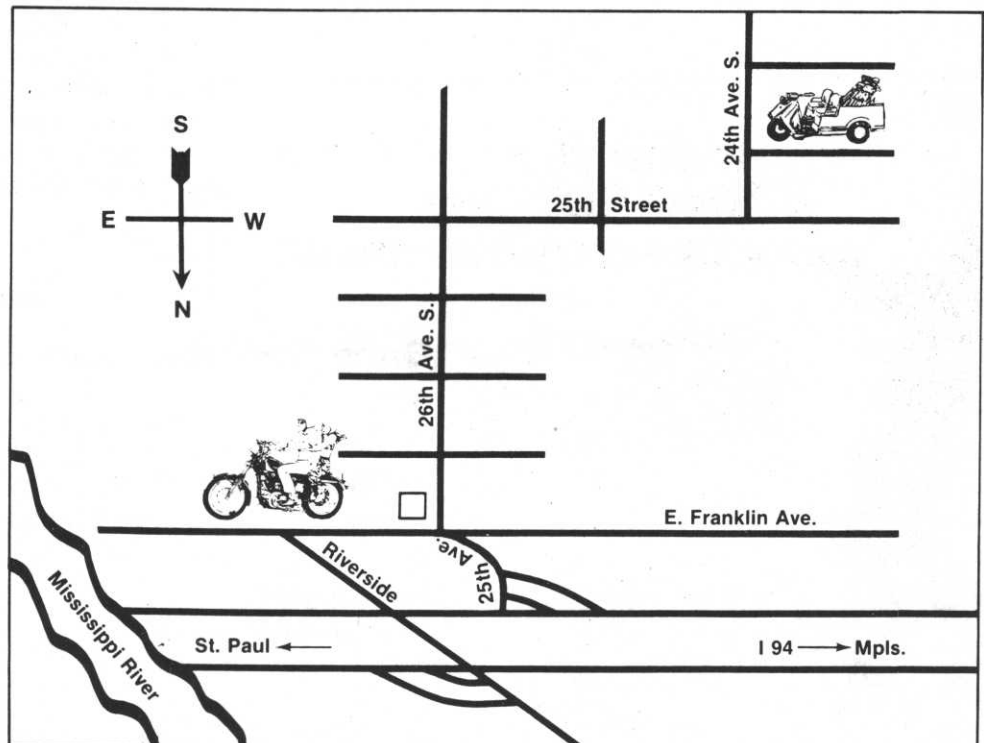
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