liation in 1982 was 8.1 million acres, down from 13 million acres in 1981. Populations are collapsing in parts of the Northeast. The decline may be related to a buildup of nucleopolyhedrosis virus in forested areas and the low temperatures last winter. The Carolinas and Virginias are the areas of greatest new activity. Trap catches and egg mass counts show gypsy moth is in the outbreak phase in some parts of Maryland.

In tests last year, *Bacillus thuringiensis* (Bt), used at 12-16 Billion International Units (BIU) per acre, gave foliage protection equal to chemicals (Sevin) and the cost was competitive. More states will use or are considering switching to Bt because it is acceptable to environmentally concerned citizens.

Predicting what will happen in 1983 is as difficult and hazardous as predicting the weather. On the National level, a decrease is expected in the overall infestation. Ohio, Pennsylvania, West Virginia, Virginia and North Carolina are expected to see an increase in gypsy moth numbers and activity. There are localized "hot spots" in other states. In particular, Indiana, Ohio, Michigan, Oregon, Washington (state) and California were mentioned during the National Gypsy Moth Review held in December 1982. Detailed information for a particular locality, i.e., city or town, is best obtained from specialists working within the area, usually the state department of agriculture.

Q: *Because of difficulty in obtaining commercial mixes, I have been mixing my own soil mixes which consist of composted barnyard soil. This works well at first, then produces an algae-like, scummy film on bare spots where no seed has germinated. Do you think I should increase my sand con-*

PROBLEM SOLVERS

By Balakrishna Rao, Ph.D., and Thomas P. Mog, Ph.D.

Q: *How much grade change can a tree withstand? Does this include mulches? (Pennsylvania)*
A: Grading or other activities that cover tree roots can cause root mortality. The root system of trees is more extensive than many people realize. The roots of an open-grown shade tree can easily fill a circle as wide as the tree is tall. This fact is often overlooked when constructing buildings and parking lots, laying drain tiles or burying lines for utility services. These activities disrupt the soil profile. Topsoil is removed or buried; subsoil from the B-horizons is brought to the surface, pushed and piled on top of tree roots.

There are no steadfast rules, only guidelines, as to how much fill or grade change a tree can tolerate.

Six inches of heavy, poorly drained subsoil covering the roots can kill an established tree.

One inch of fill kills some roots, but not necessarily the tree.

It is true that mulches cover *part* of the root system but no one would use subsoil as a mulch. Assuming that an acceptable material is used, mulching to a depth of one to six inches should not harm the tree. The thickness will depend upon factors such as the size of the tree, the health of the tree and the nature of the mulch. The best advice regarding grade change is—don't do it. If you must change the grade around trees, seek professional advice from an arborist or landscaper *before*, not after, the grade change is made.

Q: *What is the latest information on the gypsy moth situation and what can we expect in 1983? (Maryland)*
A: Gypsy moth is present in 32 states. According to the Federal Animal and Plant Health Inspection Service, total defo-

compete with the algae. Improve air circulation, if that is a contributing factor, by pruning tree branches. If desired, apply copper sulphate as a dilute solution at 2-3 oz. in 4 gallons of water per 1000 square feet. After the algae die, the application of 2-3 lbs. per 1000 square feet of hydrated lime will act as a desiccant and help adjust the pH, discouraging algal growth. Often fungicides like Mancozeb or Thiram, used for disease prevention, also provide adequate algal control.

You may have to overseed large bare spots and maintain good cultural practices to avoid future algal problems.

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Questions should be mailed to Problem Solvers, Weeds Trees & Turf, 7500 Old Oak Blvd., Cleveland, Ohio 44130. Please allow 2-3 months for an answer to appear in the magazine.

tent (now at 65%) and let me know where I could send samples of the soil and mix for analysis? I have had only the standard pH (6.5) and nutrient tests done so far. Also, irrigation is from an algae-ridden lake too big to treat. (Minnesota)

A: I do not believe that increasing sand content from 65% would help minimize the algal problem, although using coarse instead of fine sand would be beneficial. Several factors such as poor drainage, compacted soil and low pH can either individually or cumulatively contribute to algal problems. Algae is most often associated with wet soils and is most common in situations where the turf is already weak or not in an active state of growth. Reports also suggest that, in contrast to moss, algae is often associated with high nitrogen and phosphorus fertility. Generally, algae associated with turf are not parasitic. However, when the algae dry up, a rather impervious black crust is formed which will prevent water and pesticide movement into the soil. The crusts developing on the shoots of the turf can absorb heat and impair growth.

Check and adjust the pH (6.5) of the inherent soil. Most state universities have soil testing laboratories. In addition, there are a number of private soil lesting labs in the United States. For additional information, contact your local extension service department.

Improve surface drainage. If the soil is compacted, coring or aerification practices should help minimize the problem by improving water infiltration and aeration. Determine the reasons for poor germination in some areas. Perhaps the algal crust may be preventing the germination. These bare spots make an ideal location for algal growth under favorable conditions. Also, recognize the fact that you are using algae-contaminated water for irrigation which probably is the main source for algal buildup. If possible, control the algae and then use the water for irrigation.

Raise the mowing height to increase the vigor of the turf to