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Problem Solvers

Michigan State University Extension
Oakland County

Vigorous Plants Combat Gypsy Moth Damage

Impact on Tree Health

Unfortunately for trees, gypsy moth feeding and defoliation occur in the spring as the new leaves are developing. For the tree, this is the worst possible time during the growing season for this damage to occur because the tree is using stored energy reserves to promote leaf and twig development. When significant defoliation occurs, the tree must call on remaining energy reserves to develop another set of leaves. This additional loss of energy weakens the tree. Also, the foliage, which serves as the food factory for the tree, is present for a shorter period during the growing season. As a result, the net energy production is less. Note, if defoliation occurred late in the growing season, the impact on the tree health would be far less severe because the tree has already stored a major portion of its energy reserves by August.

When trees lose energy and become weak, they send out mysterious signals that attract borers and bark beetles. These insects ultimately can kill the tree. Also, trees become more susceptible to root rots and infections of the trunk and limb system. It has been said that gypsy moth doesn't, by itself, kill trees, and essentially this statement is true. Gypsy moth weakens trees, and makes them susceptible to attack by other pests that can kill the tree.

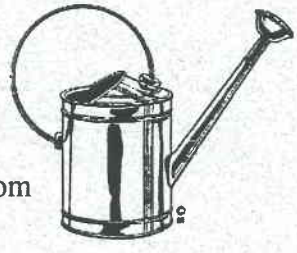
This publication contains pesticide recommendations based on research and regulations. Changes in pesticide regulations occur constantly. Some pesticides may no longer be available or legal for some uses. **Always read the label before selecting and using a pesticide.**

Improving Tree Health

Trees that are vigorous and healthy have greater stored energy reserves, and can rebound from gypsy moth damage with less serious consequences. Unfortunately, many urban trees have less than optimum vigor because they are already suffering from the effects of "urban living." For example, the following are examples of urban tree "stressors."

1. **Loss of the forest and/or natural environment and its benefits**
2. **Soil compaction**
3. **Root restriction and damage**
4. **Grade level changes**
5. **Water table changes**
6. **Physical damage to the trunk**
7. **Salt damage**
8. **Diseases and insects: encouraged by the lack of natural controls**

To improve tree health, we need to stimulate vigorous growth in all three systems of the tree.....roots, trunk, foliage. The following are the techniques that can be used, and a combination is often required.



1) Irrigation: While trees have extensive root systems that can exploit the soil more effectively than garden plants, they suffer from prolonged drought. Keep in

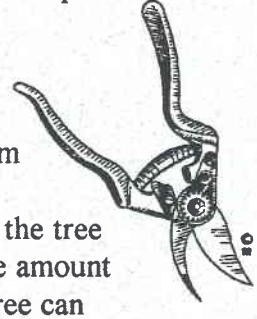
mind that most of a tree's root system lies within the upper two feet of soil. To water a tree, apply at least one inch of water to the root zone area. Make this application once per week. Use a sprinkler that can apply the water slowly to avoid runoff and puddling. Also, remember that a tree's root zone extends beyond the drip line of the tree. In general, to calculate the effective root zone, measure the distance from the trunk to the drip line, take 35% of this distance and add it to the drip line measurement. For columnar trees, use 50% plus the drip line distance measurement. Hint! one inch of water is roughly equal to one gallon of water per square foot. Frequent, light irrigations applied for lawn maintenance will not be effective for tree irrigation. On heavier soils, be careful not to drown newly planted trees and shrubs that can suffer from the rootball in a tub effect that develops when water can not drain from planting holes. Root feeding needles, such as the Ross Root Feeder can be used for watering, but their use is time consuming for larger trees.

2. Root Regeneration Stations (Vertical Mulching): Root growth can be stimulated by increasing aeration and injuring small roots. By stimulating root growth, the overall vigor of the tree is improved, and the root systems of many urban trees are suffering from the effects of compaction, root restriction, etc. This technique can be accomplished by drilling holes in the root zone. Concentrate the holes near and slightly beyond the drip line. The holes should be about 2 feet deep. Small diameter holes can be left open while larger diameter holes can be filled with a peat moss enriched, topsoil mix. Fertilizer can also be added to the holes.

3. Mulching: Grass roots and tree roots compete with each other. Mulching with natural materials eliminates this competition and also conserves moisture. Mulching also eliminates the serious damage to the trunk caused by lawn mowing equipment and string trimmers. A three inch depth is of mulch adequate, and do not pile mulch against the trunk.

4. Fertilization: Urban trees can become nutrient deficient because they have been removed from the recycling of plant nutrients that occurs in a forested environment when organic debris decomposes. Lawn fertilization provides some beneficial effects, but the grasses usually absorb most of the nutrients applied to the lawn area. Nitrogen is the nutrient that is primarily deficient and helpful in stimulating plant growth. Soil tests can be helpful in determine the exact analysis of the fertilizer that should be applied.

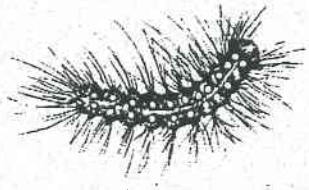
In most cases, a high nitrogen, low phosphorus, moderate potassium lawn fertilizer is a suitable choice. Soil release nitrogen is also helpful. An analysis, such as 24-4-8, would be generally suitable. The best times for application are in the spring, as soon as the soil thaws, and in late summer. However, weak or stressed trees can be fertilized outside this suggested time frame. In most cases, the fertilizer should be applied to holes drilled in the root zone (see 1. above). Liquid, soil injection applications are also popular with commercial services. Tree, fertilizer spikes and Ross Root Feeder applications can also be used, but these techniques are costly for larger trees. Injecting nutrients into the trunk or spraying nutrients onto the foliage are more effective for the application of minor nutrients where small quantities of nutrients are required. Surface applications can be used for plants not surrounded by a lawn. The suggested application rate is 3 to 5 lbs. of actual nitrogen per 1,000 sq. ft. of root zone.



5. Pruning: Weakened trees will compensate for the loss of vigor or root system by dying back. In effect, the dieback balances the vigor of the tree and its energy supply with the amount of foliage and twig area the tree can support. Dead wood should be removed with the correct pruning techniques. If dead wood is left in the tree, a safety hazard can develop, and over time, dead wood can lead to the formation of

cavities and other forms of structural weakness.

6. Pest Control: Trees weakened by gypsy moth damage can not afford to lose more leaf surface or vascular conductivity to attack by other diseases and insects. Minor pest problems can become more severe when combined with gypsy moth damage. For example, late season leaf loss caused by disease or insect damage is usually a cosmetic problem; however, for a tree trying to recover from gypsy moth defoliation, this damage will greatly increase the possibility of tree mortality. When trees have been defoliated by gypsy moth, special attention should be given to reducing damage by other diseases and/or insects.



Resources

E- 786 Fertilizing Shade and Ornamental Trees

E- 2303 Gypsy Moth in Michigan: Home-owner's Guide

NCR 356 Fertilizing Garden & Landscape Plants & Lawns

E- 1947 Planting & Care of Ornamental Plants

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