

radiation during the day and radiate heat in the evening. These mulches can stress plants and increase air conditioning costs.

Mulch insulates the soil from surface temperatures. After becoming frozen in the winter, mulch is slow to warm in the spring, which slows root growth and function. It is better to apply organic mulch after a hard frost in the fall or after frost in the spring. The insulating effect of mulch can also delay hardiness development. It should not be placed in contact with trunk surfaces; this will allow the trunk base to acclimate for winter. This may be very important in grafted and budded plants with graft junctions near the ground line. Under certain conditions, as frost occurs, the temperatures just above a mulch may be a few degrees lower than the temperatures above bare soil. This sometimes causes winter injury and bark splitting.

Nutritional Imbalance. A nitrogen deficiency may develop when fresh mulch is used. Mulch should be composted and applied to the surface, but not incorporated. If using fresh mulch, add a little nitrogen fertilizer.

Calcareous materials (e.g. marble, limestone, volcanic rock) should not be used where soil pH is above 6.5. Acidic rainfall dissolves this material, causing the soil pH to raise and makes micronutrients (e.g. iron, manganese, zinc, copper) less available to the plant. This may result

in deficiency-related diseases.

Toxicity. Toxic substances can be produced when fresh organic mulch is improperly composted. Composted mulch has an earthy odor; avoid using any mulch with a sour or foul odor. Fresh mulch, especially wood chips, becomes covered with hydrophobic fungal spores. The water is repelled and the chips do not wet; therefore, they do not decompose. A few drops of dish soap or wetting agent will correct with problem.

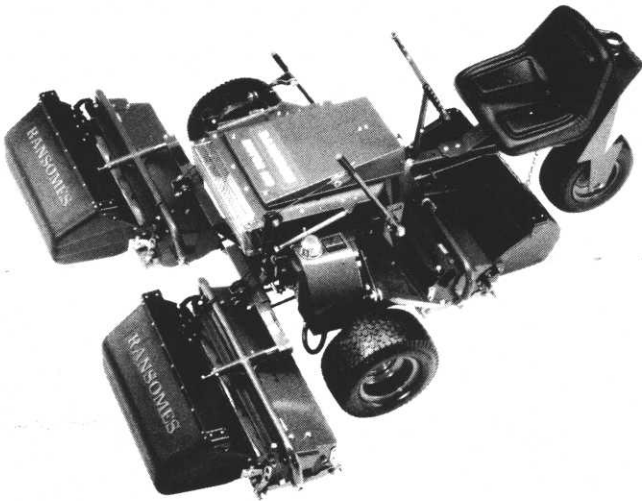
In 1981 an experiment was begun to study the effects of turf and mulch on 40 newly planted, bare root, 2-2 1/2 inch diameter "Green Mountain" sugar maples. Mulched trees received a basal layer of two inches of composted leaves topped with two inches of wood chips, mostly fresh, applied on eight-foot diameters. Turf trees had turf to the trunk. The mulch has reduced scorch, increased growth and color, and increased survival compared to the trees surrounded by turf. Two inches of fresh wood chips are being added every 203 years.

EARLY SUMMER TREE NOTES

by Bert T. Swanson
MINNESOTA EXTENSION SERVICE

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year's rains has created all kinds of biological activity or lack thereof.

Drought stressed sugar maples were extremely slow and limited in breaking bud on the upper one-third to one-half of the tree. These trees should be watered and fertilized thoroughly to facilitate vegetative growth. By midsummer it should be apparent what is dead and what will continue growing. The dead wood should be removed.

Some drought stress, plus the late hard freeze in Mid April, was significantly injurious to the new growth of many oaks and to some extent growth on green ash. These were set back but have since pushed new buds and appear to be progressing satisfactorily. However, when a second flush is required, it greatly depletes the plant's carbohydrate reserves and decreases its tolerance of any subsequent injuries or diseases.

The birch leafminer, canker worms and the European pine sawfly larvae are certainly taking their toll on trees and shrubs. At this time the feeding period of all three of these insects is about complete so actual treatment of the insect is to no avail. However, some insects such as the birch leaf miner and others will have a second generation hatch about late June. Therefore, it is useful to spray plants with a systemic insecticide according to the label.

This will allow for the building of some insecticide within

the plant as well as provide some contact upon arrival of the pest. Two applications may be necessary. The European pine sawfly larvae were particularly devastating on mugo pine. It would take approximately two days for all the old needles on a 3-foot mugo pine to be completely gone. Aphids were already becoming prevalent by June 10 and if the rain continues, be observant for fungal diseases that will be much more aggressive this year than last year.

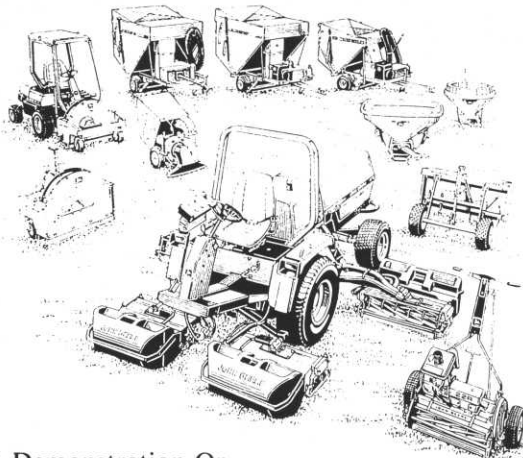
Treat with insecticides and fungicides according to the label where potential economic injury exists. However, also use preventive treatments by providing proper cultural practices including watering, fertilizing, aeration of the soil for trees in heavy clay, pruning or anything that enhances the fiber and overall growing conditions for the plant.

VERTICILLIUM WILT TROUBLING TO SHADE TREES

by **Cynthia Ash & Ward C. Stienstra**
MINNESOTA EXTENSION SERVICE

Ventricillium wilt is a fungal disease which interferes with the water conducting system in shade trees. The fungus

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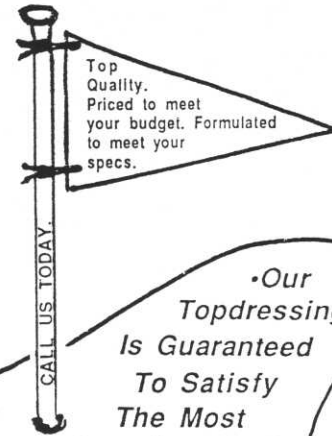
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