

THE EXTENSION LINE

Hole Notes welcomes the addition of Bob Mugaas of the University of Minnesota Extension Service as a regular contributor. As Hennepin County Extension Agent, Mr. Mugaas will compile various articles related to the golf field for our information. Bob is an excellent source for answers to many questions on horticultural problems. He may be reached at 542-1420. Written requests should be sent to:

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This month's article covers bark beetles and their affect on pine trees.

DROUGHT STRESS BARK BEETLES TAKE TOLL ON MINNESOTA PINES

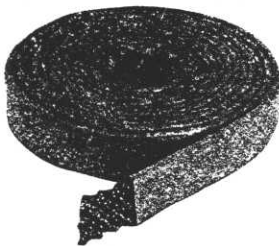
by **JEFF HAHN**
Minnesota Extension Service

Many Trees suffered through the drought of 1988. Pines were no exception and thousands were killed by the pine engraver beetle, *Ips pini*. This beetle attacks all species of pines, although red, jack, and Scotch pines are most commonly affected. The beetles bore into fresh logging slash or stressed and dying trees. Drought stress of pines is usually rare in the Great Lakes region; the number of pines killed this year by bark beetles was much higher than in normal years.

When pines are stressed, pitch flow and production of chemicals toxic to bark beetles are reduced, leaving trees susceptible to insect attack. Pine engraver beetles locate these stressed trees with their sense of smell. The adults excavate galleries and deposit their eggs. The larvae hatch and feed in the phloem layer, slowing girdling the infested branch or trunk. This results in eventual death of the tree.

It is difficult to combat the pine engraver beetle. The Department of Natural Resources (DNR) suggests several strategies for urban areas including watering, thinning overcrowded stands, using pheromone-baited traps, and, in some cases, using "trap" trees. Removing limbs killed by bark beetles does not lessen the tree's attraction to the beetles unless tree vigor is also improved. If properly done, stand thinning, watering, and fertilization can help

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improve tree vigor.

Removing trees killed by bark beetles will not affect beetle reproduction unless this material is destroyed while the beetles are still under the bark. Adult beetles overwinter in the duff and litter. The following spring, they will use green logs and slash from late winter cuttings or stressed trees for reproduction. It is important to destroy or debark such material or remove it from the site for processing before spring arrives. Cuttings made during the fall or early winter generally are unsuitable for breeding because they have dried out by the time the beetles resume activity the following spring.

In areas with a large number of pines, DNR relies primarily on pheromone traps, thinning or harvesting stands, and tree traps. Using trap trees requires that trees be sacrificed to draw the beetle attack. These trap trees should be monitored closely by someone who is familiar with the bark beetle life cycle. Timing is critical and failure to remove and destroy trap trees before beetle emergence actually makes the problem worse. Assistance is available through the local DNR office.

Pheromone-baited traps use a synthetic lure to attack beetles to a trap where they are collected and killed. The value of pheromone traps for Ips pini control is still uncer-

tain, but DNR is currently conducting research trials on this technique.

Bark beetle populations probably will be high again this year, causing concern for pines. People wishing to receive a copy of the new publication "How to Identify and Manage Pine Bark Beetles" should contact their local DNR forestry office or possibly their county extension agent.

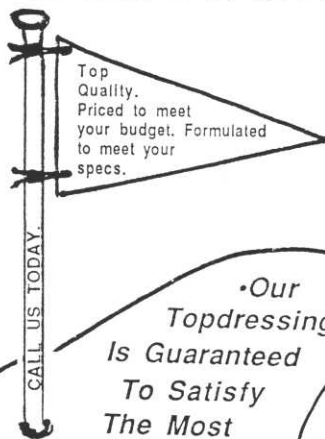
SHORT COURSE IN HUMAN RELATIONS

The best short course in human relations we've heard about is this one published by columnist Norton Mockridge:

- * **The six most important words** in our language are, *I admit I made a mistake.*
- * **The five most important words** are, *You did a good job.*
- * **The four most important words**, *What is your opinion?*
- * **The three most important words**, *It you please.*
- * **The two most important words**, *Thank you.*
- * **The single most important word**, *We.*
- * **And the least most important word**, *I.*

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