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Preventing Root Graft Transmission Of Dutch Elm Disease

NOTE: Civic officials and community leaders are confronted with many questions when Dutch elm disease is found in the elm trees of their community. This publication is a reproduction of an Iowa State University pamphlet and tells how to prevent root graft transmission of Dutch Elm disease. Other Idaho publications dealing with Dutch elm disease are available from your Extension Agricultural Agent's office or the University of Idaho Extension Service in Boise (83701) or Moscow (83843).

The spread of Dutch elm disease can only be suppressed when community action programs include strict sanitation of healthy elms, immediate removal and burning of diseased elms, prevention of disease transmission through root grafts, chemical control of the bark beetle vectors and the planting of replacement trees other than elm.

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Many communities have spent thousands of dollars to prevent Dutch elm disease by spraying and sanitation, only to have the disease spread from diseased to healthy trees through natural root grafts. Once the disease has become established in a community, spread through root grafts may be responsible for the death of up to 80 percent of the elms killed by the disease. Theoretically, a single case of Dutch elm disease can eventually spread through root graft connections to every tree in and around an entire city block.

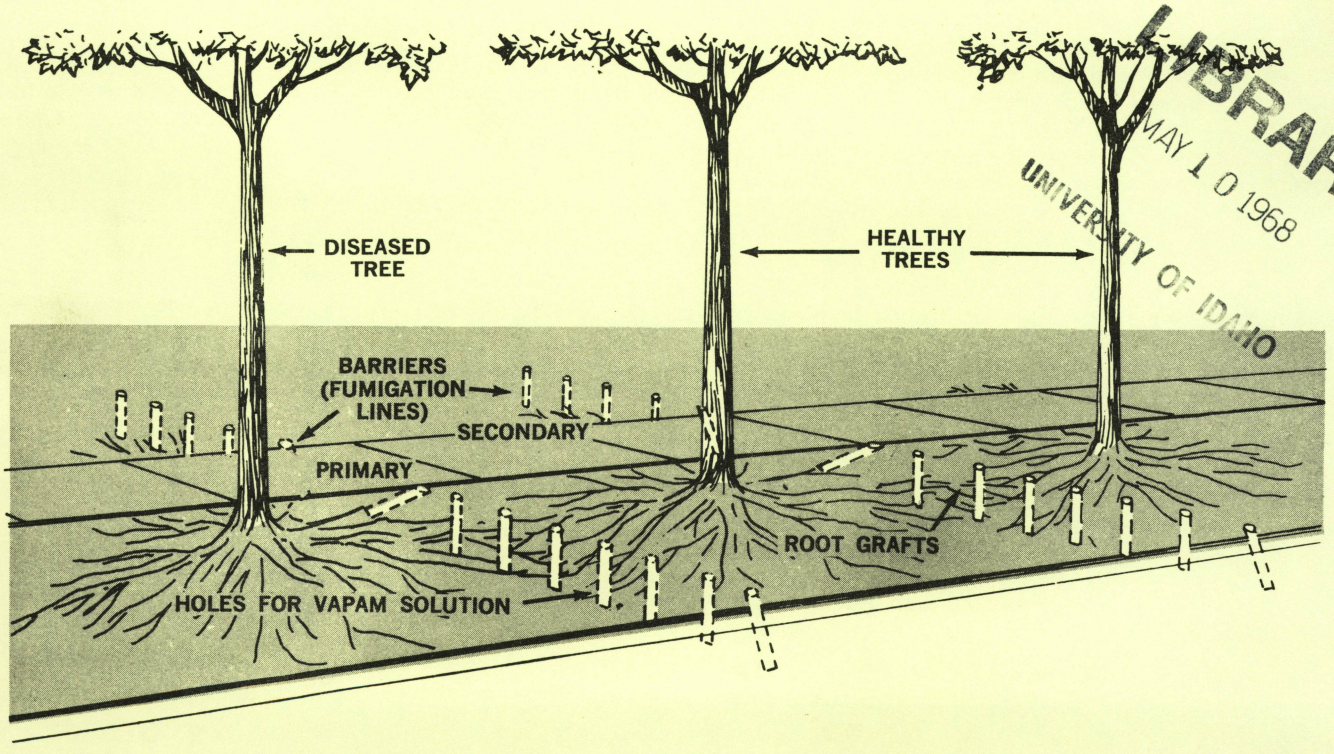
The extent of root grafting varies with the distance between trees. Elms 50 feet apart are likely to be grafted. Large elms may be grafted over greater distances.

The only way to prevent this type of disease transmission is to create a barrier between diseased and healthy trees by severing the connecting roots. This may be done by digging a trench 30 inches deep or injecting a fumigant into the soil.

When a number of trees must be treated, in a park for example, use of subsoiling equipment may be an economical way to sever root grafts. Under ordinary conditions, however, the recommended procedure is to treat with a fumigant, sodium N-methyl-dithiocarbamate (SMDC).*

SMDC should be applied as soon as Dutch elm disease symptoms appear. This usually occurs in June and July. Place a primary barrier between the diseased tree and the closest healthy-appearing tree, and a secondary barrier between the first and second healthy-appearing trees. This is neces-

*Sold under the trade names Vapam and VPM.



sary because the first healthy-appearing tree may have already become infected before the treatment takes effect.

Here is a list of equipment needed to sever root grafts with SMDC:

Soil probe or electric drill and ½ inch steel rod 36 inches long
SMDC concentrate
Supply of water
Measuring equipment for mixing SMDC solution
3-gallon garden type sprayer
Mall, flat-ended stick or rod

Procedure:

1. Locate the primary barrier about halfway between the diseased and healthy-appearing trees. Extend it well beyond the drip line of the trees. If the trees are less than 20 feet apart, there may be danger of chemical injury to the healthy tree. Where this is the case, locate the barrier closer to the diseased tree than the healthy tree.

Locate the secondary barrier between the first and second adjacent healthy-appearing trees as shown in the illustration. Treatment with SMDC is basically a root pruning process. A barrier located too close to a tree may result in severe chemical injury and a reduced root system which might injure the tree during a drouth. When trees are planted close together, such as on city streets and in farm windbreaks, it may be advisable to isolate the trees in groups of two or more. Supplementary watering may be helpful during extended periods of dry weather.

2. Make the holes 25 inches deep. You'll probably need some type of power equipment to drill the holes. A commercially manufactured tool known as a **power probe** may be used. But you can do an adequate job with a ½-inch industrial weight electric drill and a 36-inch length of ½-inch steel rod. A piece of electrical tape wrapped around the rod 25 inches above the end makes a convenient depth gauge. Space the holes 6 inches apart. Elm roots may grow under sidewalks or paved streets. Slant several holes under these obstructions as shown in the illustration. Root graft connections between elms on opposite sides of a paved street are highly unlikely.

3. Prepare SMDC solution by mixing 1 part chemical concentrate with 4 parts water.

4. Fill the holes with SMDC solution to within 2 inches of the top. You'll need about a cup of solution for each hole. When treating only a few trees, pour the solution into the holes with a funnel. Use a garden sprayer for treating a larger number of trees. Remove the sprayer nozzle and apply under low pressure. Tamp the holes closed immediately to prevent escape of the fumes. Push a small amount of soil or sod over the hole from one side. Gently tamp the soil down with a mall or large flat-ended stick or rod. The chemical kills grass, so avoid spillage. Flush the sprayer thoroughly with water after use to prevent corrosion.

5. SMDC will kill the lawn in a strip about a foot wide along the barrier. Repair this area by reseeding or sodding 2 weeks after treatment. Or leave it undisturbed, and grass from the adjacent area will fill in the strip within 6 to 8 weeks under normal conditions.

6. Wait at least 2 weeks after treatment before removing the diseased tree. This will give SMDC time to take effect. Moving the tree before the chemical has taken effect may accelerate root graft transmission of the disease.

7. Keep a record of treated areas. Check the areas periodically so you can evaluate the effectiveness of the treatment. If disease symptoms occur in the first adjacent healthy-appearing tree, place another secondary barrier between the second and third healthy-appearing trees. Procedures may have to be modified because of local conditions.

8. Observe these precautions:

- Do not leave open SMDC containers in enclosed places.
- Wear rubber gloves when handling SMDC. Avoid skin contact with the chemical.
- Do not inhale the fumes.
- A gummy precipitate may occur in SMDC which has been stored for a period of time. Do not treat root grafts with SMDC which contains this precipitate.
- When possible, do not locate the barrier closer than 10 feet from the tree being protected.

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