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**DUTCH ELM DISEASE**

Dutch Elm Disease was first discovered in Moscow in July 1990 on the University of Idaho campus. The infected tree died within 2 weeks of exhibiting symptoms. Because of the possible severe and devastating effects on elm trees in the community, steps were taken to control the problem. At the time the first Moscow Tree Committee (now Commission) was created and established to document, and limit the spread of DED. Very few incidences were recorded since then; however, in May 2006 the first of what would total ten outbreaks was discovered at the East City Park. In 2007 about 21 trees total were discovered to have DED in the city limits and required removal. (R. Blanchard, City Forester)

**SUSCEPTIBLE TREES**

Elm trees in Moscow (East City Park and city limits) during the outbreak of 2006-07 that were infected are the American Elm (*Ulmus americana*). Other species that are also susceptible to infection are the Scotch Elm (*Ulmus glabra*),and English Elm (*Ulmus procera*).Two other types of trees in the city of Moscow that have shown resistance to DED are Siberian Elm (*Ulmus pumila*) and Chinese Elm (*Ulmus parvifolia*).

**HISTORY**

Since I was working for the City of Moscow as the summer intern under the direct supervision of Roger Blanchard the City Forester, it was my job after the initial discovery in 2006, to locate all of the elm tress within city limits, and conduct a diagnostic assessment of those trees for DED. It was my job to look for the symptoms of DED, and report back to Roger. I was told to look for signs of flagging in the upper canopy.

**SYMPTOMS**

Flagging occurs when infected branches suddenly start to droop or wilt and the leaf will start to turn yellow to brown and eventually die back. At this point, a branch displaying these symptoms will internally display brown streaks right under the bark (Figure 1). This became my key to identifying the DED. The combination of flagging branches and brown streaking is what allowed me to positively identify the trees with disease to be either removed completely or have the diseased portion pruned. This occurs first in the upper crown and I saw many examples of these signs through various stages leading to the appearance of some branches to be bare. In the initial stages only the infected branches will shows signs of dieback with the rest of the tree appearing healthy.

**CAUSE**

DED is caused by a fungus (*Ceratosystis ulmi*) and is spread by the European elm bark beetle. Healthy trees will show disease symptoms in May or June and can die within one to two weeks. The fungus is spread by these beetles feeding on the V-crotches of smaller branches (leading to flagging), and breeds under the bark of dead or weakened elms.

**SPREAD**

The disease is spread by infected beetles as they feed and breed and over winter as larvae in the inner bark to emerge as adults in the spring. In doing this they leave a distinct pattern of feeding on the secondary cambium called a gallery (Figure 2). The disease is also transmitted via root graphs between healthy and infected trees.

**CONTROL**

Currently there is no cure for DED, but some preventative actions can be undertaken. Stopping the spread starts with sanitation. Infected trees should be removed all the way down to the stump (stumps must be debarked to below ground level) and all wood should be buried, burned or chipped. Prune dead or dying branches when less than 10 % of tree is infected, which could become breeding sites. Spraying insecticides might control the spread of infected beetles if done at emergence, but this method is very timely and might not be cost effective. The City of Moscow undertook a systemic fungicide injection regimen of Phyton 27 in water solution in the last two years to try to inactivate beetles before the fungus can be transmitted. Trenching of roots of healthy trees near infected trees was also undertaken to help prevent the spread of the disease (Figure 3). No preventative control method is 100% effective, but with early detection and rapid disposal and removal of symptomatic trees it ensures the best method.

Figure 1: Brown streaking of elm trunk tissues right under the bark are one symptom of the presence of Dutch Elm Disease.

Figure 2: Insect larvae galleries on the trunk just under the bark.

Figure 3: Trenching of elm tree roots to prevent disease spreading from infected to healthy trees.