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An astonishing number of ash trees (*Fraxinus* sp.) are currently dead or in various stages of decline around Michigan. An area, which has a very high percentage of ash trees affected by this malady, is delineated by Livonia, Plymouth, Canton and Dearborn in Southeast Michigan. It is estimated that 10,000's of trees are affected in this area alone. In small areas, such as several square blocks or a square mile area, in excess of 90% of the ash trees may be affected. The economic impact is staggering when removal, disposal and replacement costs are considered. Since we've begun investigating this area, other reports from elsewhere in Michigan confirm an ever increasing problem both in natural areas, in landscapes, and in some nurseries. Until we have determined the cause(s) of the problem more succinctly, I have elected to call the problem "ash decline."

**Symptoms:** The earliest symptoms of ash decline is a yellowing of the foliage on one branch or section of the tree. Over the period of a growing season or several years, the chlorosis extends into other areas of the tree, with eventual dieback, stunted growth and sparse foliage. Trees usually eventually die. An apparent common recovery mechanism on many of these trees is the abundant and dense proliferation of "adventitious" shoots from the main trunk or lower scaffold branches (see Fig. 1). This proliferation of shoots undoubtedly indicates a very healthy root system, probably precluding the possibility of a severe root rot disease as the primary incitant.

**Cause of Ash Decline in Michigan:** At this time, we are uncertain of the exact cause of the ash decline. However, two insects, the red headed ash borer and two-lined chestnut borer (Fig. 2 and 3), have been identified in association with ash decline. These two insects are considered secondary pests, attacking trees under stress. It would not surprise me that other borers or insects or diseases are eventually associated with ash decline. Stress factors which may attract borer problems include: drought, winter injury, adverse soil conditions (compaction, poor drainage, root suffocation from too much irrigation, etc.), girdling from roots or nylon rope/baskets, and other diseases such as ash yellows. Entomologists often suggest that secondary borer insects are simply performing their natural role by attacking trees under stress. While this is probably true, there is an undeniable fact that no ash tree proceeds through its life without some sort of stress. The high populations of stressed ash trees (some would argue over-planting of ash) exacerbated by the unusually high population of borers in some areas probably represents an ever increasing insect pressure on semi-healthy or healthy trees. This epicenter effect has been noted in Canton, Plymouth, Livonia and Dearborn areas.



Figure 1

**Management of Ash Decline:** At this time, there are probably several management procedures that can be employed to inhibit ash decline and prevent further spread of the problem.

**Sanitation:** All ash trees which are dead or in advanced decline should be removed and properly destroyed. Based on current understanding, I think that any tree which exhibits 50% or greater branch loss should be removed. Perhaps we will revise this to 30 or 40% in the coming months as more information is gathered. Proper disposal includes chipping, burning, and burying. If wood is to be kept for firewood, it should be burned in the coming winter. If the firewood is to be dried for a year or so, it should either be debarked or sealed under a tarp during the warm season. These methods should help minimize spread of the insect borers.

**Landscape Design:** In some areas where ash decline is a problem, it is possible that ash populations are too high, facilitating the epidemic. Consider alternative species of trees if at all practical.

### Reduction of

**Plant Stress:** Key to reducing susceptibility trees to borer activity is to reduce stress and increase vigor in trees through supplemental water and fertilization; excesses of water and fertilization can also stress trees. Proper planting and site preparation can also help reduce problems later in the trees' life. Various cultural practices aimed at increasing tree health are vital to reducing the chances of ash decline.



**Figure 2** Note borer larvae & abundant disruption of the vascular area.

### Insecticide Injections:

Although not demonstrated, insecticide injections should help minimize borer activity in trees and possibly help trees through stressful periods. These injections may also help reduce the threat from high borer populations in certain areas. Various injection methods are available; consult your local arborist for details.

If advice and assistance are desired, consult your local arborist and landscaper. They can offer assistance in maintaining established trees and for finding alternative plants.

There are several areas, which need attention before we can truly finalize our understanding of ash decline in Michigan. First, we need to determine species of ash most susceptible; there may be species or varieties of ash that are less susceptible to ash decline. In the spring of 2002, a diagnostic survey should be performed on a representative sample of ash trees to determine if ash yellows or other causes are involved in ash decline. Additionally, field control studies can be implemented to try to inhibit further ash decline development in our communities.

For more information, please visit my web site: [www.msue.msu.edu/reg\\_se/roberts/index.html](http://www.msue.msu.edu/reg_se/roberts/index.html) ; I will try to keep it updated as we learn more.



**Figure 3**