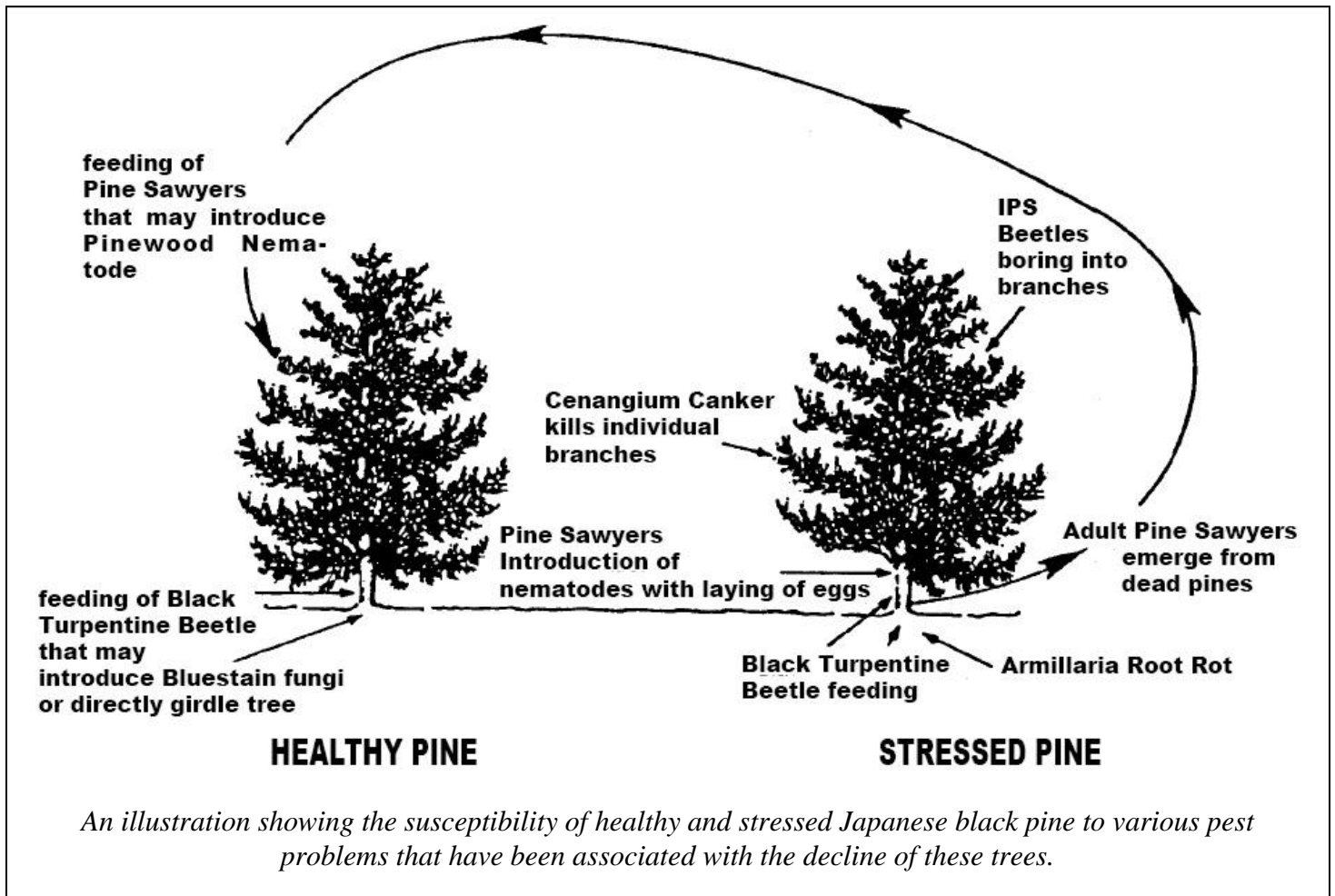




The Japanese Black Pine - What's Happening?

Since the 1940's the Japanese black pine, *Pinus thunbergii*, has been one of the most widely planted trees in seashore landscapes on Long Island. This evergreen tree has been valued for its ability to withstand salt spray and its usefulness as a windbreak and/or screen. Although it is so widely planted that it seems a natural feature of the landscape, the Japanese black pine is actually an exotic ornamental on Long Island, introduced from Japan and Korea where it is native.



Since the 1970's Japanese black pines on Long Island have been dying in relatively large numbers on the North and South Forks as well as in western Suffolk County and Fire Island. The trees most susceptible to problems seem to be 15 to 20 or more years in age. Initially the trees which were most often seen dying were those exposed to the harshest growing conditions. Usually they were receiving little maintenance and they were growing in very sandy soils, often exposed to the rigors of a seashore location. There seems to be a continuing correlation between trees growing in stressful conditions and those that die. The illustration above outlines some of the factors involved that are known to have caused the Japanese black pine to decline and/or die on Long Island.

Black Turpentine Beetle

In the late 1970's, the black turpentine beetle, *Dendroctonus terebrans*, (**Fig. 1**) was discovered attacking Japanese black pines on the South Fork of Long Island. At that time personnel from Cornell Cooperative Extension - Suffolk County and the Long Island Horticultural Research Laboratory in Riverhead developed information and control suggestions for this pest. Since then the beetle has been responsible for infesting trees on the North Fork of Long Island as well as in parts of western Suffolk County and on Fire Island. These insects have also been reported on *Pinus rigida*, the native pitch pine. The boring of the black turpentine beetles causes resin to flow, harden and produce the characteristic pitch tubes (**Fig. 2**), which are usually seen on the lower 4 to 5 feet of the trunk. The larvae, which feed on the inner bark, may completely girdle the tree. Although pitch tubes are a good indication of black turpentine beetle attack, they will not be apparent if the beetles have attacked below the soil line, as is occasionally the case. Beetles have been found in the major roots of Japanese black pines even though no pitch tubes were visible on the main trunk above ground.

Often a blue-stain fungus, *Leptographium* sp., (**Fig. 3**) is carried by the beetles and introduced into the tree. The killing of cambium by this fungus often magnifies the injury from the black turpentine beetle.

These two factors are often looked upon as the primary cause for the death of Japanese black pine that are at least 15 to 20 years of age and situated in the often-stressful site of the seashore landscape as well as non-seashore landscapes. Affected trees turn a lighter green color, eventually turning brown and dying. This symptom progression will often take place within a few months.

Pinewood Nematode

The pinewood nematode, which is thought to be native to this country, has also been identified as another major factor in the death of the Japanese black pine on Long Island. Samples of pine taken from New Suffolk, Springs (East Hampton), Muttontown, Jones Beach and Orient State Park were found to contain this nematode. Pinewood nematodes are microscopically tiny, unsegmented worms, which are carried to healthy pines by an insect vector, a long-horned beetle called a pine sawyer, *Monochamus* spp. (**Fig. 4**). While the beetle feeds on branches at the top of the tree, nematodes gain entry through the feeding wounds and proceed to multiply and feed within the resin canals of the pine. A toxin produced by bacteria carried by these parasitic nematodes causes yellowing and death of foliage of often at first just a single branch. Ultimately the entire tree succumbs. The pine sawyers are attracted to dying (including nematode-killed) trees to lay their eggs. Two years after egg-laying, adult beetles bore out from the dead trunks, leaving 1/4 inch round holes. Their bodies may be contaminated with pinewood nematodes, which will hasten the demise of healthy pines that the beetles feed upon. Note that the presence of pinewood nematodes in a dying tree does not



Fig. 1. An adult black turpentine beetle (Wayne Dixon, Florida Dept. of Agriculture and Consumer Services, www.bugwood.org)



Fig. 2. A close-up of a pitch tube on a tree trunk in comparison to a half-dollar (North Carolina University Archives, North Carolina University, www.bugwood.org)



Fig. 3. A section of a pine tree trunk showing symptoms caused by a blue-stain fungus (Ronald F. Billings, Texas Forest Service, www.bugwood.org)

necessarily mean that they caused its death: pine sawyers will also introduce nematodes as they lay eggs in trees that are already dying from some other agent.

The New York State Department of Environmental Conservation (NYSDEC) has now stopped growing and shipping Japanese black pine seedlings from the state nursery largely due to the trees' vulnerability to pinewood nematode. At this point they are offering no plant substitute with the characteristics or adaptability of the Japanese black pine. A "Long Island Shore Species" tree packet is offered for sale to the public. For more information contact the NYSDEC web site <http://www.dec.ny.gov/environmentdec/25417.html> or the NYSDEC Saratoga Tree Nursery, 2369 Route 50, Saratoga Springs, NY 12866; phone 518-587-1120. The real question now is - are pinewood nematodes the real cause of

death in the majority of Japanese black pine on Long Island? The importance of this question is due to the fact that there are no known controls for the nematode. On the other hand, arborists have been able to reduce losses of the Japanese black pine to the black turpentine beetles with a combination of timely insecticide sprays and increased maintenance, including quick removal of dying trees and their stumps. Successful control is most likely when an infestation is identified early and when the blue-stain fungus has not been introduced.

Staff from Cornell Cooperative Extension and the Long Island Horticultural Research Laboratory went to Orient State Park to look at the Japanese black pine situation in that location. On the majority of pines which had been cut down or were showing symptoms of decline, pitch tubes from the black turpentine beetles were found at the trunk base. Some of the tubes were freshly made that spring of the visit, and some were from previous years. At the entrance to the park, many very large trees showing no symptoms were next to trees with fresh pitch tubes, which showed the classic symptoms of decline and/or dying that have been associated with black turpentine beetle and/or blue-stain fungus. Other trees in the park that showed no pitch tubes above ground did have branch-by-branch foliar yellowing symptoms that are typical of pinewood nematode, which has been found in several pine samples taken in the Park. At that time in the Orient State Park site it appeared that pinewood nematode and black turpentine beetle were sharing responsibility for death of pines and it would be difficult to determine which had the more significant role.

Pine Engraver Beetle

Another beetle pest that is often found in what is believed to be a stressed or declining Japanese black pine is the pine engraver beetle, *Ips pini* (Fig. 5). This species has at times been reported to be an aggressive pest. Beetles in this genus are often referred to as *Ips* beetles. They differ from members of the genus *Dendroctonus* by their elytral declivity and associated spines (Fig. 5). These beetles make clean egg galleries, and they engrave sapwood. One of the more common symptoms observed in pine trees is the presence of numerous tiny holes (Fig. 6), about the size of the point on a pencil, in the branches and trunks of infested trees. One of the first symptoms of attack is the presence of reddish boring dust (shavings) that is pushed out of these tiny holes. This dust will then collect on the rough bark of pine trees.

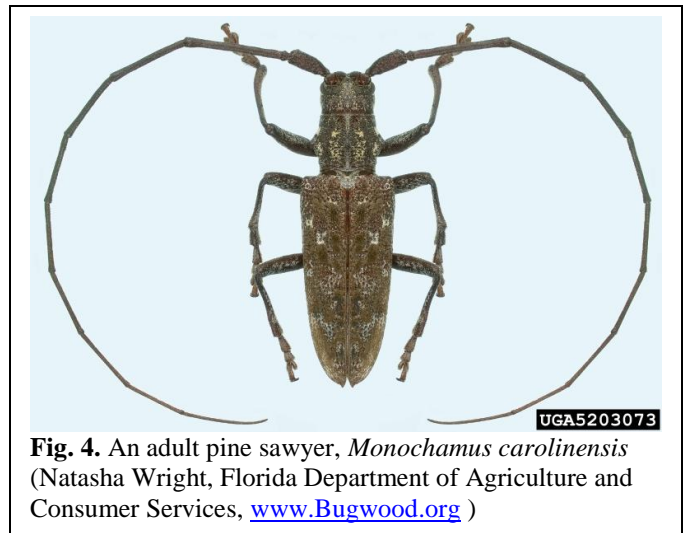


Fig. 4. An adult pine sawyer, *Monochamus carolinensis* (Natasha Wright, Florida Department of Agriculture and Consumer Services, www.Bugwood.org)



Fig. 5. An adult pine engraver, *Note the elytral declivity and associated spines.* (Ladd Livingston, Idaho Dept. of Lands, www.bugwood.org)

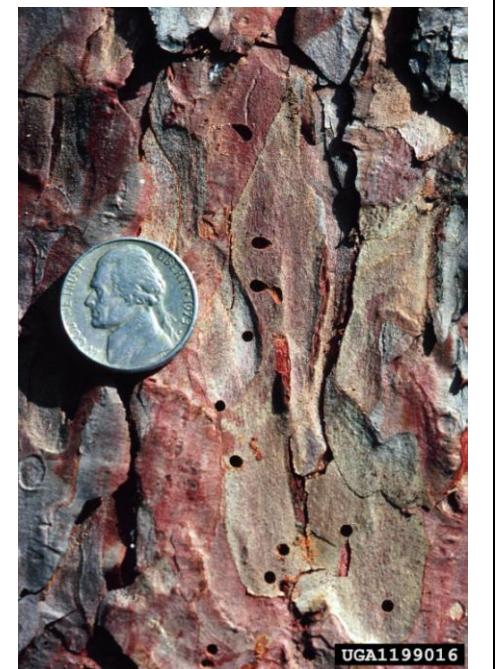


Fig. 6. Tiny holes from *Ips* beetles compared to a nickel (Steven Katovich, USDA Forest Service, www.Bugwood.org)

Pine Vole

Although probably not the most common cause of Japanese black pine death on Long Island, injury from pine voles, *Microtus pinetorum*, has also been seen in many landscapes. These rodents feed on the bark of roots and the lower trunk of the trees. This injury can at least weaken and may in some cases cause the death of the tree. Deep mulches or needle litter under trees can hide the network of tunnels and exit/entrance holes of these rodents.

***Cenangium* Canker**

In some sites in the past such as on Shelter Island and Amagansett on the South Shore of Long Island, the Japanese black pine has succumbed to a fungus disease called *Cenangium* canker. The opportunistic fungus enters branches through wounds and causes at times a significant amount of dieback. Stresses that may make a tree susceptible to infection include drought, wounding, extremely cold weather or hurricane injury. Infection takes place any time between mid-July and mid-September. Clusters of small, brown, cup-like fruiting structures can be seen on branches, in the scars where needle bundles were attached years before.

What Should Be Done Now?

It is obviously wise to look for acceptable replacements for the Japanese black pine for Long Island's seashore landscapes. In the meantime it may still be one of the most useful trees for true seashore conditions, where a windbreak is needed. Eventual replacement cost should be anticipated, as older trees appear to be more susceptible to all the known pests. Also, when planting these trees it would be wise to incorporate a maintenance plan that would include deep irrigation during periods of prolonged hot, dry weather. Ideally a properly installed, pressure compensated drip irrigation system would be an efficient way to water the trees. Proper fertilization based on soil and/or foliar analysis could also help trees to maintain good health. Avoid unnecessary pruning - let the trees grow to their natural form. Use discretion when recommending or requesting the use of Japanese black pine in the landscape. Unless a tall windbreak tree in a true seashore condition is needed, it would be wiser to use other plants that will accomplish the same or similar results. Another choice could be *Juniperus virginiana*, the eastern red-cedar. This tree is native to Long Island and is often found growing in the sandy soils near the seashore. If a tall plant is not needed in a seashore landscape, consider some of the smaller plants that grow well in these sites. Some of these are *Myrica pennsylvanica*, the bayberry; *Prunus maritima*, the beach plum; *Rosa rugosa*, the rugosa rose; or *Ilex glabra*, the inkberry. Also, encourage native plants to develop in these sensitive areas. They are naturally adapted to these particular sites.

In conclusion, it may not be wise to totally disregard the Japanese black pine when planting a Long Island landscape, but its high susceptibility to fatal insect and disease problems should be taken into account. Landscape designers and architects, horticulturists, as well as the homeowner are all responsible for seeing that the Japanese black pine is not overused in the landscapes which are not in seashore locations.

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For more information refer to: [*Black Turpentine Beetle and Its Role in Pine Mortality*](#); [*Voles*](#); and [*Cenangium Canker*](#). Printed versions of these leaflets are available from Cornell Cooperative Extension - Suffolk County.

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