Nebraska's pine trees are under attack from two serious pests–the mountain pine beetle and pine wilt disease.

The mountain pine beetle, a small insect that has killed millions of acres of pines in the western U.S. and Canada, was identified last year on pines in several western Nebraska counties.

So far, the insect has killed only a few trees at several scattered locations, but it can kill many trees easily when conditions are right.

Forest health experts with the Nebraska Forest Service said mountain pine beetle attacks have been reported in Scottsbluff, Gering, Minatare, Kimball, Sidney, and areas of the Wildcat Hills and Pine Ridge.

Mark Harrell, Nebraska Forest Service forest health program leader, said adult mountain pine beetles bore into pines from July through October, leaving small, marble-sized masses of resin, called pitch tubes, on the trunk.

"Adult beetles are black, about one-fourth-inch long and lay eggs in the tunnels between the bark and wood," Harrell said. "Grub-like larvae hatch from the eggs and feed in the tree until July of the following year. The tunnels made by the larvae can kill a tree if enough larvae are present."

According to Harrell, Scotch pine and ponderosa pine are the trees killed most often in Nebraska. When trees die from the beetle, they should be removed and either chipped, burned, buried or have the bark stripped off before mid-June to reduce the risk of the beetles spreading.

Insecticide trunk sprays can be applied to prevent attacks on high-value trees and should be applied in the late spring but before mid-June.

"Carbaryl is the most effective insecticide for mountain pine beetle," said Harrell. "Bifenthrin and permethrin are also effective." Only products that have directions for mountain pine beetle on the label should be used, and insecticides will not control beetles that have already entered the tree, he said.

In forested areas, dense stands of trees are often stressed and more susceptible to attack. Thinning dense stands will improve tree health and reduce the susceptibility of the trees to the beetle.

"The other major problem we have with pines is pine wilt in the eastern and south central parts of the state," said Harrell. "Since entering Nebraska about 10 years ago, pine wilt has killed an estimated 10,000 pines, mostly Scotch pine."

Trees infected with pine wilt die from the disease, so it is important to take steps to prevent its spread, said Harrell.

Pine wilt is caused by a microscopic, worm-like organism called the pinewood nematode. These nematodes live in pines and are carried from tree to tree by insects called pine sawyer beetles. Once inside the tree, the nematodes disrupt the flow of sap, causing the tree to turn brown and die.

Harrell said pine sawyer beetles begin emerging in May, so all trees that died last summer or fall should be removed and destroyed by the end of April.

Trees that die from May through September should be removed and destroyed within a month of the tree's death to prevent the beetles from emerging and spreading the disease to new trees.

Trees killed by pine wilt should be disposed of by chipping, burning or burying to ensure beetles in the wood are killed. Chipped trees can safely be used as mulch in gardens or around

trees, even pines as long as the mulch is not resting against the trunk.

"A chemical treatment to protect healthy pines is available, but the expense usually limits its use to very valuable trees," Harrell said. "The only approach we have for dealing with pine wilt on a large scale is to reduce its spread by quickly removing and destroying the trees that die from it."

Approximately 95 percent of the pines killed by pine wilt are Scotch pines, but Austrian pines are killed occasionally by the disease as well. In Nebraska, pine wilt is found generally south and east of a line