Cytospora canker - *Cytospora kunzei var. piceae*

- An important disease of spruce in landscape. This disease is caused by a fungus and is frequently found on Norway spruce and Colorado blue spruce and its cultivars. White spruce is also susceptible and there are a few reports on Serbian spruce. In addition to the spruces, Cytospora canker is sometimes found associated with Douglas fir, hemlocks, larches, and balsam fir.
- Symptoms - Dying of a lower branch with subsequent needle browning is usually the first symptom. The brown needles may remain on the branches or they may fall off. As the disease progresses over several years, higher branches show damage. The actual cankers are often first seen at the base of branches near the main trunk of the tree. On the more susceptible species (Norway spruce), trunk cankers develop which may result in girdling and death of the tree.
- The bark of the cankered areas is not visibly different in color, nor does it become sunken as in cankers on many deciduous trees. However, resin flow is usually associated with Cytospora canker and the white patches of dried resin are quite conspicuous on the bark. Resin flow can, however, be associated with any injury to branch tissue.
- Cytospora canker of spruce is caused by the fungus. Spores (conidia) are readily disseminated by splashing water, wind-driven rain, by man during pruning, and also very likely by insects and birds. The fungus generally becomes established through wounds.
- Cytospora canker is more common on trees over 15 years old. This disease is more prevalent on trees of low vigor. Those trees with shallow roots, weakened by drought, low fertility, mechanical injury, or insect damage; and trees growing in an unfavorable site are more susceptible to Cytospora canker.
- The following practices lessen the likelihood of this disease:
    - Avoid bark and stem injuries.
    - Control insects and mites; especially spruce gall adelgids and spider mites.
    - Fertilize according to horticulturists' recommendations.
    - Water during extended dry periods. Water thoroughly so that soil is moistened 18 to 24 inches deep. A root irrigator may be needed to accomplish this.
    - Follow accepted pruning practices.
    - Vertically mulch to relieve soil compaction, poor aeration, and inadequate water penetration.
    - Once established, the following may aid in suppressing disease development. Remember that affected branches cannot be saved.
    - Prune and remove or destroy affected branches. To lessen the spread of the fungus, prune only when the trees are dry. Pruning tools should be disinfested with 70% alcohol between cuts. It will generally be necessary to prune back to the main trunk. No effective chemical control measures are available.

Spruce beetles - *Ips hunteri*

- *Ips* is a common group of bark beetles that infests pine and spruce trees.
- *Ips* beetles rarely attack healthy trees. Most problems with *Ips* occur to newly transplanted pines or when plants are under stress.
- Several generations of Ips can occur in a season.
- Common species affecting Colorado blue spruce in landscape settings. Upper portions of the tree are typically infested first.
- *Ips* beetles are generally not considered as destructive or aggressive and normally limit their attacks to trees that are in decline due to root injuries, wounding, or other stresses. However, large population build-ups of *Ips* beetles are a considerable threat to living trees. Two factors that recently contributed to Ips beetle problems in urban areas of Idaho include prolonged drought stress, the creation of freshly-cut wood (which is a preferred breeding site) by forest homeowner efforts to reduce wildfire hazards and also homeowners bringing in infested firewood from the forest to their homes in town.
- Adult beetles enter trees and tunnel, a yellowish- or reddish-brown boring dust is produced and accumulates in bark crevices or around the base of the tree. When the larval tunnel, affected parts of the tree discolor ("fade") and die. These symptoms may be limited to parts of the tree, such as a single branch or the top. However unlike mountain pine beetle, infestation by *Ips* beetles does not necessarily mean the whole tree will die, but over time, attacks may progress as later generations "fill" the tree and then ultimately the host can die.
- Small round holes in the bark of infested trees indicate the beetles have completed development in that part of the tree and the adults have exited. The presence of these holes peppering the bark show the beetles have moved to another part of the same tree or to neighboring trees.
- Woodpeckers are common predators of *Ips* beetles. Their presence may also indicate bark beetle activity. Woodpeckers often remove the tree bark in an effort to obtain this food source. This habit results in ragged holes or patches of missing bark on the tree.
- To prevent *Ips* beetle attacks, use practices that promote vigorous tree growth. Properly placing trees in landscape plantings is important to allow optimal growing conditions as the tree matures. Adequate – but not excessive – water may be needed. Root injuries caused by mechanical damage, compaction, or disease should be avoided.
- Freshly-cut material that results from pruning or thinning practices (called "slash") should be removed from the vicinity of valuable trees. Never stack green or infested coniferous wood next to living coniferous trees. Such green woody material should be chipped or treated so that the inner bark area is destroyed. *Ips* larvae will not survive standard chipping or debarking treatments. Other treatments could include scattering (as opposed to piling) slash to promote rapid drying.
- Trees at risk of *Ips* attack include newly transplanted trees, trees suffering root injuries from construction, and trees surrounded by large breeding populations of *Ips* beetles. These types of trees can benefit from preventive insecticide applications.
- Insecticides are used as drenching preventive sprays on the trunks and larger branches. These insecticides need to be applied prior to adult beetle infestation (overwintering

beetles begin emerging in spring as soon as daytime temperatures consistently reach 50°F to 60°F). Application timing can be difficult to determine since Ips beetles can have multiple, overlapping generations and life cycles. Adults have been observed entering trees during warm days as early as late-February on through November. Because of this extended activity, two treatments (early spring and summer) may be needed to protect trees during high-risk conditions.

- Insecticides used to prevent *Ips.* Follow the manufacturer's recommendation for the proper rate for bark beetle treatment. Bark beetle applications at the labeled rate should provide at least three months control of *Ips* beetles.
- No chemical treatment exists for trees or wood already infested by Ips beetles.
- You can kill beetles in newly fallen trees by bark removal, chipping the wood into small pieces, covering piles with a double-layer of 6-mil thick clear plastic sealed around the edges with soil to heat (solarize) the wood, or physical removal of infested material from the site to an area a mile or more from susceptible trees.

Eriophyid mites

- *Eriophyid* mites are part of a group of insects that are mostly unknown and undescribed.
- They are very small (their size is measured in micrometers) and are undetectable with a conventional hand-lens or common dissecting microscope.
- These torpedo-shaped, slow moving insects dive in and out of leaf stomata to feed on interior leaf tissue.
- On conifers, their damage is expressed by chlorotic, distorted, or dwarfed needles, by rosetted bud/needle clusters similar to witches'- brooms, by galls, and by partial defoliation of old as well as current season's needles.
- They are found on the buds and foliage of all North American conifer species.
- Because these mites are not visible without powerful magnification, they often go undetected until extensive damage has occurred.
- Currently, these insects are recognized as being a problem in Idaho and there is a recommended control in the PNW handbook. I have had landowners have success with imidacloprid.

Balsam woolly adelgid – *Adelges piceae*

- The balsam woolly adelgid was introduced from Europe around the turn of the century.
- It has become an important pest of true firs. It causes considerable damage to the Fraser fir Christmas tree industry.
- Adult adelgids are blackish purple, roughly spherical in shape, less than 1/32 inch (1 mm) long and almost invisible to the naked eye. The adelgid produces a covering of white wax threads and appears as white, woolly dots about the size of pin heads on the surface of the tree's bole, limbs, and buds. Eggs are produced under the adults and are orange in color. The immature stage of the adelgid, known as a "crawler," is also orange, with legs and black eyes. Eggs and crawlers can be identified with the aid of a hand lens.

- In its native range, the aphid has two generations per year, and occasionally three in the southern Appalachians. Eggs of the first generation hatch in late June and July, followed by a second generation in September and October. The "crawler" is the only mobile stage in the adelgids life cycle. When a crawler begins feeding, it transforms into a first instar nymph and becomes stationary. Reproduction is parthenogenic each female lays up to 200 eggs. The adelgid overwinters as a first instar nymph and continues its development in the spring when the host tree starts its annual growth cycle.
- During the adelgids feeding process, the host tree is stimulated to produce abnormal wood cells. This reduces the tree's ability to translocate food and water. Initial symptoms of adelgid attack may include gouting of buds or twig nodes and some twig and branch dieback. This is very evident on seedlings, young understory trees, and Christmas tree plantings. Other damage may be stunted shoot and needle growth and loss of apical dominance in natural stands. A heavily infested tree may die within 2 to 7 years. As the tree, dies, portions of the crown or the entire crown will turn red.
- Chemical control is effective, but extremely costly. Thus it's usually limited to high value resources such as recreation areas, seed sources, and shade, ornamental, and Christmas tree plantings. Other control measures include removal and destruction of infested trees.

Shoot moths – various genera

- We are mostly dealing with European pine shoot moth (*Rhyacionia buoliana*), though we also have the western shoot moth.
- Most two and three needle pines are susceptible (ponderosa, Austrian, Scots).
- Small, slender moths with an 18 mm wingspan. They have light orange-yellow heads and thoraces, grey abdomens and light reddish orange forewings mottled with silvery cross lines.
- Moths lay eggs on or near buds at the end of terminal buds in spring and early summer. Larvae mine base of needles then burrow into a bud to overwinter. Mining damage is usually accompanied by webbing and a flow of resin. Most damage is done in the spring, secondary injury is in the form of deformation of the tree axis, forking and bushing.
- Hatch as pale yellow brown caterpillars, with black heads and thoracic shields, mature to dark brown and grow to 10 mm in length. Larvae bore into tips of terminals and laterals and kill them.
- Often causes flagging. Continued attack on terminal buds results in many secondary shoots which makes trees very bushy. Small trees can be killed.

Poplar borer – *Saperda calcarata*

- Main hosts: quaking aspen, balsam poplar, eastern cottonwood
- Damage results in swollen bark areas, sap run and piles of frass around the entrance to galleries near the base of the trunk and the roots are signs of the poplar borer’s presence. Bark swelling caused by larval activity is more visible in young poplars. Cankers can be quite large and often resemble raw meat with sap running down from the wound.

- The insect has a long life cycle, extending over 3 to 4 years. The adults feed on the foliage and the tender bark of twigs. The females lay their eggs in slits they have cut in the bark. After hatching, the larvae begin feeding in the cambium and then penetrate into the heartwood by creating deep galleries. In the spring of the last year of larval development, the larvae change into pupae and then into adults.
- The poplar borer is a species native to North America. It is found throughout the geographic range of poplar in Canada and the United States. The borer usually attacks poplars growing on poor sites.
- This particular attack was on urban trees in Ketchum – all quaking aspen.

1000 Canker Disease on walnut

- This story begins in the summer of 2005. A landowner I work with in Meridian called saying his walnuts were starting to die. I also had a call from Will Cook over in Emmett – same thing. I called the City of Boise and talked to the forester. They didn't know what was happening, but mature walnut trees that were healthy on July 1 were completely dead on August 1.
- They said they were finding a lot of ambrosia beetles in the trees, but thought it was drought stress killing the trees. This didn't make sense to me because the 'problem' was spreading from west to east and was occurring on both irrigated and un-irrigated sites. The wilt thing really bothered me as well – didn't fit the pattern for trees dying from drought stress.
- Went to Meridian and collected samples from Roger William's place. There were indeed a lot of little bitty holes in the stems of the smaller trees, which were completely dead. Brought sample back to Moscow.
- Had Steve Cook, our Forest Entomologist have a look and he said,"*those are not ambrosia beetle holes, too small. I think that is walnut twig beetle (Pityophthorus juglandis)"*. We went to confirm the identification with Frank Merickel, the curators of the Entomology Museum at the College of Ag. It turns out he had identified about 100 walnut twig beetles from samples sent to him in 2003 from the Boise/Meridian area.
- When I got back to my office I 'Googled' walnut twig beetle and came across some folks at Colorado State University, Whitney Cranshaw and Ned Tissant, who were working on the same mystery. They had identified the twig beetle and were linking it and drought stress, with perhaps a pathogen, as well. Stated in an email from Ned:
    - *As early as 2003 foresters in Boulder County began to notice a decline and mortality of black walnut. Trees initially showed branch dieback, but rapidly declined and died, often within one year. Mortality was initially attributed to drought, but the problem continued unabated even in years with normal precipitation and on sites not prone to drought stress. By September 2007, over 250 black walnuts had been killed. This represented a majority of the total black walnut population in that city. Walnut mortality also has been noted in Colorado Springs and other cities in the Denver Metro area.*

    - *In 2003 the walnut twig beetle (Pityophthorus juglandis) was observed on declining black walnut trees in Colorado Springs. This was a new report for Colorado. In 2004 the beetle was recovered from dying walnut trees in Boulder and by 2006 it was consistently found in declining trees. This beetle is native to the Southwestern United States and is*

apparently a minor pest, causing dieback of twigs and small diameter branches on stressed trees. Black walnut is not a natural host of this beetle. However, the activity of the beetle on black walnut in Colorado is much more aggressive than previously reported on native hosts. The beetles successfully attack branches in excess of 3 inches in diameter, causing major branch dieback on J. nigra. The behavior of these beetles is alarming.

- *In 2006 and 2007 we observed long vertical trunk cankers caused by the fungus Fusarium solani during the final stages of tree decline. This fungus is widespread in North America on J. nigra and typically colonizes and causes cankers following tree injury or stress (e.g. low temperature damage). F. solani was not isolated from beetle galleries or the walnut twig beetle and we do not believe P. juglandis is a vector of this pathogen.*

- *Prior to the 2001 black walnut die-off in the Espanola Valley of New Mexico (Anonymous 2002) the insect was apparently never been associated with tree mortality and in this first report it was speculated that it was associated with drought. The more recent confirmed captures in several eastern Colorado locations, and the suspected presence in Utah, Idaho and Oregon, would involve substantial range extensions of the insect.*

- *Although minute (1.5-1.9 mm), attacks by adults P. juglandis are not confined to twigs. Nuptial galleries produced by colonizing males have been commonly seen large diameter branches of >5 cm diameter. At the point where beetles enter, stained wood typically develops around the beetle tunnel. This staining apparently is produced by colonization of the wound by a fungal associate, producing small cankers, often >1 cm diameter. Where multiple attacks by adult bark beetles are made, the cumulative effects of such cankers and beetle wounding become so extensive that they may largely girdle the branch. Larvae have also been observed in the trunk, although only along margins of trunk cankers.*

- Work continued. We were all pretty sure by now that there was a fungal associate that produced the wilt-like symptoms and rapid death. In an email dated May 9, 2008 Ned wrote:
  - *We are calling this disease thousand cankers because trees literally die from beetle attacks and the formation of thousands of cankers on the tree. In my opinion this canker/pest complex poses a major threat to black walnut should it be introduced into its native range.*

- So, thanks to Ned, we now had a name to go by. Ned was successful in isolating a fungus, *Geosmithia* spp. He wrote:
  - *In fall 2007 a fungus called Geosmithia (identification based on morphological characteristics and rDNA ITS sequence similarity of 98%) was consistently isolated from branch and twig cankers surrounding beetle galleries and directly from the beetles by Ned Tissant and group. Geosmithia spp., are associates of bark beetles of hardwood trees, but have not previously been reported as a pathogen of Juglans or an associate of P. juglandis. We inoculated one-year-old black walnut seedlings with two Geosmithia isolates in the greenhouse. The fungus aggressively colonized the bark and cankers were formed three weeks after inoculations. We (Ned Tissant and group) currently have no information on*

the origin of the Geosmithia fungus, but are collaborating with entomologists in California to determine the flora associated with P. juglandis in its native range and working with a researcher in the Czech Republic on fungal taxonomy.

- I went to Boise in March 2008 and met with the folks at Boise Park and Rec. and Jim Hoffman, Forest Pathologist with the Forest Service. Took more samples, but it was too early and too cold to get anything from them.
- Jim went back later in the spring, took new samples using a bucket truck and sent them off to Colorado.
- In June I received an email from Ned stating:
    - *We have isolated the Geosmithia fungus from the cankers associated with the beetle galleries and confirmed its presence in Idaho. We now believe that the beetle is vectoring this fungus and that this combination, in possible association with another fungus (Fusarium) is causing the decline. We have no idea how to control this. Whitney Cranshaw and I are going to try some Merit insecticide preventive treatments. However, other curative insecticide treatments have been a failure.*

- 1000 cankers disease on walnut is now entered as a new state record for *Geosmithia* sp. in the National Agricultural Pest Information System (NAPIS).
- We have a name and we know what is happening. Sanitation (pruning out affected branches and removing them from the site) and deep watering, especially during hot weather could help, but to date we have no recommendations for control

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New Aspen Problem?

- Bill Josey, Arborist-ArborCare Resources, Inc., initially collected samples of the scales and sent them to a scale expert at Colorado State University, Whitney Cranshaw. Whitney tentatively identified them as *Diaspidiotus gigas*, the willow scale, poplar scale, or armored poplar scale, many common names.
- Apparently, it is a European species but has been around the western US for awhile. The scales, moderately to densely spaced all the way up tree boles, are having a detrimental effect on the aspens.
- Symptoms noticed were: thinning crown, bending at mid-upper bole, extensive branch mortality and breakage. There were some issues with the proximity of the weakened trees to residences.
- So far, the scale has not been located on aspens on National Forest System lands, but they are infesting aspen growing in Ketchum. Possible explanations for the presence of this scale on subdivision and town trees could be that it was introduced by imported aspen and its proliferation could be attributed to overwatering and other stress issues associated with urban areas.

Banded elm bark beetle – *Scolytus schevyrewi* (Pronunciation: Sko-li-tus chevy-rev)
An Asian Bark Beetle New to the United States

- *Scolytus schevyrewi*, the banded elm bark beetle, was first collected in insect traps set in Aurora, CO (a suburb of Denver), and Ogden, UT, in April 2003. Dr. James LeBonte, Oregon Department of Agriculture, first identified the beetle as new to the United States.
- By the fall of 2003 this bark beetle had been collected in the following states: Arizona, California, Colorado, Idaho, Illinois, Kansas, Nebraska, New Mexico, Oklahoma, Oregon, South Dakota, Utah, and Wyoming. Recent examination of the state insect collection in New Mexico revealed that *S. schevyrewi* was present in Clovis, New Mexico, as far back as 1998.
- The beetle was observed attacking and killing drought stressed Siberian elms. The Animal and Plant Health Inspection Service (APHIS), state forestry organizations, and the U.S. Forest Service are currently working together to map out the range and impacts of this exotic bark beetle.
- *S. schevyrewi* is native to Asia, where its hosts include a variety of native elm species, willows (*Salix* spp.), fruit trees such as apricot, cherry, and peach (*Prunus* spp.), and Russian olive (*Elaeagnus angustifolia*).
- In the United States, the banded elm bark beetle has been found infesting and breeding in American, English, rock, and Siberian elms only. The beetle has been collected from broken elm branches, fallen elm trees, stacks of elm firewood, and elm trees stressed by drought.
- *S. schevyrewi* also has been reported to be present in trees dying from Dutch elm disease. The biology of *S. schevyrewi* is similar to that of *S. multistriatus*, another exotic bark beetle native to Europe, which is the principle vector of Dutch elm disease in the United States.
- The banded elm bark beetle completes a generation in two months or less. *S. schevyrewi* probably completes a minimum of 2–3 generations per year in the Denver area. The egg galleries of these two species of bark beetles are very similar.
- The literature suggests that newly emerged brood beetles of *S. schevyrewi* have a period of feeding at branch junctions in the canopies of living elms, like that reported for *S. multistriatus*. This is important because feeding by *S. multistriatus* on branch junctions in the canopies of elm trees is one mode of transmission of the Dutch elm disease fungus to uninfected trees
- Studies of the banded elm bark beetle indicate that some brood larvae may burrow into the outer bark of infested elms to pupate and transform into adults. This behavior may explain how this Asian bark beetle was introduced into the U.S. via wood pallets or shipping containers constructed with beetle-infested elm wood with the bark attached.
- At this time, the banded elm bark beetle appears to pose a moderate risk to elms planted as shade trees or as windbreaks throughout the inland West, particularly during periods of drought. This species appears to be more aggressive than the ubiquitous *S. multistriatus*. In areas where the banded elm bark beetle has become well established, like Denver, this beetle is much more abundant in dying elms than is *S. multistriatus*.

Asian long-horned beetle – *Anoplophora glabripennis*

- The Asian long-horned beetle (*Anoplophora glabripennis*), sometimes called Starry Sky (Sky Oxen in China) beetle, is native to China and where it causes widespread mortality of poplar, willow, elm, and maple throughout vast areas of eastern Asia.
- Asian longhorned beetles are big, showy insects: shiny and coal black with white spots. Adults are about 1 inch (2.5 cm) long. On their head is a pair of very long antennae that are alternately ringed in black and white. The antennae are longer than the insect's body.
- An invasive species in the United States, the larva of this beetle has a voracious appetite for wood. It is especially damaging to maple trees: Norway, sugar, silver, and red maple are among its preferred foods. The species also feeds on horse-chestnut, poplar, willow, and elm.
- Females of this species chew into the bark and lay eggs. When the eggs hatch, the immature beetles, which look like big white worms, chew their way farther into the tree. When they mature, the full-grown beetles chew their way out of the tree. The beetle life cycle leaves trees riddled with holes, oozing sap. The USDA believes this beetle can probably survive and reproduce in most sections of the country where suitable host trees exist. The beetle has also invaded Britain, Austria and Germany.
- The Asian Longhorned Beetle can be seen from late spring to fall, depending on the climate. Host trees include: *Acer* (maple, boxelder), *Aesculus* (horsechestnut, buckeye), *Salix* (willow), and *Ulmus* (elm.)
- The Asian Longhorned Beetle (ALB) was first discovered in the United States in Greenpoint, Brooklyn and soon after in Amityville Long Island in 1996. Since then, infestations were found in and around New York City, including on Long Island and in Queens and Flushing Park. Several infested trees were removed around Central Park, where over 20,000 potential host trees grow. The Asian longhorned beetle was believed to have arrived in New York City in the 1980s from wooden packing material. According to the Director of the Animal and Plant Health Inspection Service Laboratory of Cape Cod, MA Victor Mastro, the center of the infection zone was a warehouse which imported plumbing supplies from China. The infestations in New Jersey and on Long Island are believed to have spread from the Brooklyn point of entry. Chicago's infestation was believed to come from a separate point of entry.
- At present, it has been found in several areas in New York City and Long Island, the Chicago area (the quarantine being lifted on July 12, 2006), New Jersey, and Toronto, Canada. Longhorned beetles have also been found in warehouses in CA, FL, IL, IN, MI, NC, NJ, NY, OH, PA, SC, TX, WA, WI and in BC, ON in Canada, but has been prevented from getting outdoors.
- Over 6,000 infested trees have been cut down and destroyed to eradicate ALB from New York and over 1,550 trees in Chicago and almost 23,000 trees in New Jersey, more than 15,000 in the Linden area alone. Infested trees continue to be discovered.
- The government is trying to eradicate this species primarily because of two reasons:
    - Impact. If it becomes established in this country it could significantly impact our natural forest and urban environment.

    - Limited Infestation Size. Infestations are limited in size at this time, and the federal government still believes ALB can be eliminated completely if action is taken now.
- The steps that have been taken to eliminate the Asian Longhorned Beetle include:
    - Quarantines. Quarantines have been established around infested areas to prevent accidental spread of ALB by people. Infested trees cut, chipped and burned. All infested trees are being removed, chipped in place, and the chips are being burned. The stumps of infested trees are ground to below the soil level. All tree removal is done by certified tree care personnel to ensure that the process is completed properly.
    - Insecticide treatments. Research is underway way to determine the effectiveness of certain insecticides such as imidacloprid against ALB. Insecticidal treatments have begun in New York and Chicago in hopes of preventing and containing infestations. Chicago's program of imidacloprid treatments for healthy trees of potential host species within a one-eighth to one-half mile radius of infested trees successfully removed Illinois from quarantine in August 2006. As of December 2006, New Jersey's policy was to cut down all healthy trees of the potential host species within a one-eighth to one-quarter mile radius of infested trees.
    - Extensive surveys. All host trees on public and private property located within an established distance from an infested area are surveyed by trained local, state, or federal personnel. Infested areas will be re-surveyed at least once per year for 3-5 years after the last beetle or infested tree is found.
- Serviceberry or Shadbush, Ironwood, Southern catalpa, Hackberry, Turkish filbert, Ginkgo, honeylocust, Kentucky coffeetree, Tuliptree, Dawn redwood, White oak, Swamp white oak, Bur oak, English oak, Japanese lilac, Bald cypress, Basswood, Littleleaf linden are trees that are being planted to replace host trees.
- US customs regulations were changed on September 18, 1998 (effective December 17, 1998) to require wooden packing materials from China be chemically treated or dried via kiln to prevent further infestations of the Asian long-horned beetle from arriving. Pest inspection, new rules, and public awareness are the key steps to prevention of the spread of the Asian longhorned beetle, a beetle which could have devastating effects on our environment.

Emerald ash borer – *Agrilus planipennis*

- The **Emerald ash borer** (*Agrilus planipennis* or *Agrilus marcopoli*) is a shiny green beetle and an invasive species known for killing ash trees in the United States.
- Its natural range is eastern Russia, northern China, Japan, and Korea. It was accidentally imported to North America from China in the 1990s and has since destroyed more than six million ash trees in southeastern Michigan. It was discovered in June 2002 in Canton, Michigan. It has since been found in a few other parts of the U.S. and Canada. Ohio and Ontario have seen emerald ash borer migration from Michigan while Maryland and Virginia received shipments of contaminated trees from a Michigan nursery. The emerald ash borer was confirmed in Indiana in April 2004.

- The US Department of Ag. is attempting to exterminate all of these beetles on the continent, and has taken the unusual measure of destroying every ash tree within a half-mile (800 m) radius of known infested trees. Southeastern Michigan is a quarantine zone from which ash trees or even firewood cannot be removed. Large fines have been imposed on a few companies that violated the ban, including one that was removing ash trees from southeast Michigan and is believed to be responsible for spreading the beetle to another county. The USDA has committed at least $40 million dollars for eradication in 2004 and expects to spend over $350 million in the next twelve years.
- The insect is unusually difficult to kill. More than seven billion ash trees are currently at risk. Nearly 114 million board feet (33,000 m^3) of ash saw timber with a value of $25.1 billion is grown in the eastern United States each year.
- Michigan officials announced September 14, 2005 that ash borer infestation had crossed the Mackinac Strait and was now in the Upper Peninsula for the first time. Wisconsin environmental officials considered it a grave threat and began preparations for surveys in northern counties. Currently twelve counties in Indiana are under quarantine. However, states and cities are running out of money to combat the problem and many authorities feel that the borer will spread throughout North America.
- On June 13, 2006, the Associated Press reported that ash borers were found at a home near Lily Lake, in Kane County, Illinois. Illinois officials plan to conduct a survey of the region, and will later hold a hearing to determine if quarantine is necessary. In July, 2006, further infestations were discovered in Northern Cook County, Illinois, including Wilmette, Evanston, and Winnetka.