

**Insect and Disease Problems on Trees in Boulder County**  
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**Boulder County Sustainability Shortcourse**  
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**Are all Tree Problems Pest Related?**

70-90% of all tree related problems in landscape areas are related to environmental or site factors – not directly related to a pest. These environmental or site factors are known as “abiotic” issues and can predispose or make trees more susceptible to attack from insect/disease pests.

Examples include:

**Soil and Site Factors**

- Includes but not limited to: soil pH levels, planting too deeply, mulching/staking improperly
- Soils in city of Boulder range from 4.5 (west central Boulder) to 8.3 (Boulder Reservoir)

**Physical and Mechanical injury**

- Injury Occurs Relatively Suddenly
- Full Extent of Damage May Not Be Immediately Assessable
  - Mower
  - Lightning

**Severe Weather Events** (snowstorms, windstorms, late spring frosts)

**Chemical Injury**

- Herbicides are the most common plant damaging chemicals
- Some herbicides are systemic
  - They are mobile in the plant and soil
  - Examples: 2,4-D, Dicamba
- Prevent herbicide damage:
  - Read the label
  - Do not apply within dripline of trees
  - Spot treat rather than broadcast
  - Avoid drift

**Living Stress Factors (Biotic)**

**Nectria/Thyronectria and Cytospora Canker Fungi**

- Very difficult to “cure” a disease; Prevention is key to disease control!
- Disease prevention is dependent upon adequately meeting the basic requirements of the tree.
  - Site - select the right tree for the right site!!
  - Water - not too much or too little
  - Cultural - use resistant stock.

- Links: <http://www.ext.colostate.edu/pubs/Garden/02937.html>  
<http://www.ext.colostate.edu/pubs/Garden/02937.html>

### Dutch Elm Disease

- Banded Elm Bark Beetle found by chance in 2002; by 2005 it had displaced European elm bark beetle
- Elms mass attacked - symptoms very similar to DED
- Vector of Dutch elm disease fungus?

### Scale Insects

- Need to determine whether hard (armored) or soft scales.
- Hard (armored) scales have mouthparts in parenchyma cells so systemic pesticides (i.e. imidacloprid) are not effective.
- Soft scales have mouthparts down into phloem and do come into contact with systemic pesticides

### Douglas-fir Tussock Moth

- Defoliating insect that attacks blue spruce, white fir and Douglas-fir in urban areas
- Early season defoliator
- Most likely transported into Boulder on vehicles
- *Bt* not very effective but Conserve (spinosad) is very effective when larvae are still small
- Links: <http://www.ext.colostate.edu/Pubs/insect/05542.html>

### Mountain Pine Beetle

- Native to CO mountain forests
- Susceptible hosts include:
  - Commonly lodgepole and Ponderosa pines
  - Less commonly limber, bristlecone and pinyon pines (Scotch and Austrian in urban areas)
- 1 generation/year
- Flight Timing:
  - Lodgepole Pine (upper elevation) - mid-July to early August
  - Ponderosa pines (lower elevation) - late July, peaks ~August 10, and extends into early Sept
- Trees fade the following May to June
- Unsuccessful attacks: Very white, little to no sawdust, distinct entry hole
- Successful attacks: Small pitch tubes, darker, more boring dust, no well defined entry hole
- Control...
  - Urban Areas:

- Keep trees healthy...water, avoid damage
- Prevent importation - Watch out for infested firewood...
- Remove infested trees quickly prior to adult flights
- Mountain areas:
  - Consult local forester – CSFS, USFS
  - Preventive Sprays? Depends upon location
  - Thinning
- Links: <http://www.ext.colostate.edu/pubs/insect/05528.html>

### Ips Beetle (Pine)

- 11 different species of ips beetles in Colorado
- Can have multiple, overlapping generations per year
- Ips beetles rarely attack healthy trees; most problems with ips occur to newly transplanted pines or trees under stress.
- Spraying strictly preventive with permethrin or bifenthrin products (2 applications – early spring and summer)
- Links: <http://www.ext.colostate.edu/PUBS/insect/05558.html>

### Pine Wilt Nematode

- Major pest in eastern NE and KS
- PWN confirmed in 6 Front Range cities (including Boulder)
- Scotch pine is preferred host; Austrian pine secondary. Native pines are NOT susceptible.
- Very complex life cycle
- Vectored by native pine sawyer beetles to healthy pine trees
- Trees fade in late summer
- Links: <http://www.extension.iastate.edu/Publications/SUL9.pdf>  
[http://www.na.fs.fed.us/spfo/pubs/howtos/ht\\_pinewilt/pinewilt.htm](http://www.na.fs.fed.us/spfo/pubs/howtos/ht_pinewilt/pinewilt.htm)

### Ips Beetle (Spruce)

- Native to CO mountain forests
- Attacks usually limited to trees under stress
- Increased population due to widespread drought conditions in 2001/2002
- Multiple generations/year (3-5)
- Control...
  - Prevention/Cultural – water, water, water!!!!
  - Mechanical – tree removal
  - Chemical
    - strictly preventive (permethrin or bifenthrin)
    - Apply 2x per year
- Links: <http://www.ext.colostate.edu/PUBS/insect/05558.html>

### Walnut Twig Beetle / Canker Complex

- First detected in Boulder in 2004
- Mature trees dying within a single growing season
- What is it?
  - Walnut Twig Beetle (*Pityophthorus juglandis*)
  - *Fusarium* fungus
  - *Leptographium* – like fungus
- Black and English walnuts are susceptible
- Control...
  - Water, water water...
  - Remove infested trees
  - Trunk sprays of permethrin ?
  - Soil / trunk injections of imidacloprid ?
- Links:  
[http://www.bouldercolorado.gov/index.php?option=com\\_content&task=view&id=7801&Itemid=900](http://www.bouldercolorado.gov/index.php?option=com_content&task=view&id=7801&Itemid=900)

### Japanese Beetle

- Adult stage is serious pest of over 350 plant species – most preferred hosts include linden, cherry, rose and grape
- Larval stage serious pest of turf grass
- Eradication probably not possible
- Large population in southeast Denver
- Links: <http://www.ext.colostate.edu/pubs/insect/05601.html>  
<http://www.coopext.colostate.edu/TRA/PLANTS/jb.html>

### Emerald Ash Borer

- Introduced from Asia (now in MI, OH, IN, IL)
- Federally quarantined insect
- No more talk of eradication in Midwest
- Tunnels just under bark, D-shaped exit holes (lilac/ash borer has round exit holes)
- Causes tree mortality
- Soil Injection (imidacloprid) as preventive control?
- Links: <http://www.emeraldashborer.info/>

<http://www.na.fs.fed.us/fhp/eab/>

[http://www.na.fs.fed.us/spfo/pubs/pest\\_al/eab/eab.pdf](http://www.na.fs.fed.us/spfo/pubs/pest_al/eab/eab.pdf)