**PURPOSE**

Discuss

- Forest insects and influences on their abundance and behavior
- Status of several forest insects of concern (a defoliator and several bark beetles)
- Some specifics for pesticide applicators

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**Forest Insects**

- *Native* insects are important, integral, ecosystem components
- Part of natural disturbance regimes, like fire
- In many cases, forest changes have led to increase or decrease in activity

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**Report: Insects pose largest threat to U.S. forests**

Posted on **July 8, 2011**

According to a recent report from The Associated Press, while wildfires can be damaging, insects currently pose the greatest threat to forests in the U.S.

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**Forest/Stand Condition**

- Landscapes with increased stand homogeneity
- Stand maturity
- Stand density
- Tree species composition
Susceptibility to Bark Beetles

- Landscapes with increased forest stand homogeneity
- Stand maturity
- Stand density
- Tree Species composition
- Stressors

Historic and Current Age Distributions of Lodgepole Pine Stands in the Western U.S.

Scientists estimate that many stands are at least twice as dense as is desirable for natural resistance to bark beetles (D. Leatherman 2002)

Defoliator: Western Spruce Budworm

Forest Insect Activity of Concern

- Defoliators
  - Western Spruce Budworm
- Bark Beetles
  - Mountain Pine Beetle
  - Spruce Beetle
  - Douglas-fir Beetle
  - Western Balsam Bark Beetle

Stressors

Altered fire regimes in fire-adapted ecosystems.
Spruce Beetle in Colorado

• Numerous windthrow events in Colorado’s spruce-fir forests since 1997

• Large windthrow events are the precursor to spruce beetle outbreaks
Douglas-Fir Beetle

Gunnison Basin

Western Balsam Bark Beetle/Armillaria Root Disease

Armillaria Root Disease

Evidence of infestation
Evidence of infestation (continued)

Western Spruce Budworm
Insecticides
(applied aerially or from the ground)

Per Colorado Pesticide Information Retrieval System (COPIRS)
269 products made up primarily of 52 active ingredients

- Permethrin
- Chlorpyrifos
- Carbaryl
- Bacillus thuringiensis (B.t.)
- Timing of application is critical, especially with B.t.

Mountain Pine Beetle
Insecticides

Per Colorado Pesticide Information Retrieval System (COPIRS)
51 products made up primarily of 10 active ingredients

- Permethrin
- Carbaryl
- Bifenthrin
- Verbenone – anti-aggregate pheromone

Preventive Sprays
carbaryl, permethrin, bifenthrin

Twig Beetles in Piñon
Pityophthorus sp.
What about pheromones?
Verbenone, MCH ...

What about injectable insecticides against bark beetles?

Vegetation management must be a part of the long-term solution

Conclusions
• Much of Colorado’s forests are prone to large-scale disturbance

• Current incidence of insects, disease, and wildfire, compounded by events such as drought, are creating substantial changes in our forests

• Many tools are available to address insect occurrence and forest condition. They often need to be used in unison to achieve desired results. Scale of implementation is very important.

Getting More Information...
• USDA Forest Service, Rocky Mountain Region’s Forest Health Protection Website http://www.fs.usda.gov/goto/r2/fh

• E-mail: rmask@fs.fed.us

• Call: Gunnison Service Center (970)642-1199
QUESTIONS?