INSECTS & DISEASES

Presented to Master Foresters Class
CSFS La Junta District
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The phone rings. The first thing you hear is, “What’s wrong with my tree?” Before you’ve heard the person’s name, anything about the tree, before you’ve seen it, before you know what town it’s in, you, the expert, are supposed to use your superhuman psychic powers and give a correct answer, complete with a cheap cure.
WHERE DO YOU START?
POSSIBILITIES

• Ask Donna or Shelly
• Look in a book
• Make something up
• Tell them they have the wrong number
• Change the subject and ask them to be your friend on Facebook
• Start asking questions
• Schedule a site visit
IF YOU TAKE ONE THING AWAY FROM THIS SESSION, please believe IT IS OK TO SAY, “I DON’T KNOW*”

* PROVIDED YOU SAY YOU WILL TRY TO FIND OUT THE ANSWER
YOUR JOB IS NOT SO MUCH TO DIRECTLY ANSWER THE QUESTION AS IT IS TO FACILITATE SOMEBODY, ANYBODY, FIGURING OUT THE ANSWER TO THE CUSTOMER’S QUESTION IN A REASONABLE LENGTH OF TIME.

YOU CAN HELP BY:

1) Documentation in writing of the basics: who?, what?, when?, where?

2) Asking questions about the tree and its history, starting with big picture, narrowing to specifics

3) Visiting the site and documenting the situation with notes, photos, and samples

4) Communicating what you discovered to a forester

5) Getting the results from a forester back to the landowner
LEARN THE SE COLORADO TOP 10

- Drought
- Drought
- Drought
- Drought
- Trimmer/mower injury
- Drought
- Drought
- Herbicide injury
- Drought
- Other stuff

“The weather in southeastern Colorado over the next 3 days is hot, hot, and more hot. We can expect wind and blowing dust, with highs in the low 100s and only a slight chance of precipitation Wednesday night. For KLMR, this is AccuWeather Meteorologist Don Day”.
DROUGHT

• Not enough water to ring the bell
• Affects trees from outside-in, top-down
• Outside edges of tree crowns begin to brown
• Outside edges of individual leaves begin to brown
• With water restrictions and lack of natural moisture, what to do?
• Winter watering might help
• Favoring trees over lawns seems to make sense
TRIMMER/MOWER INJURY

- Root collar wounding is worst
- It happens, but widespread, chronic abuse is completely preventable!
- Clearing grass from tree bases is helpful in removing temptation to get too close to stems with equipment
- Seasonals (and lazy permanent workers who should know better) need to be told and told again not to do this
HERBICIDE INJURY

Linden leaves aren't supposed to look like Dutch shoes.
HERBICIDE INJURY

• Most is caused by drift due to application on hot days
• Trees near ag fields very susceptible
• Of course, avoid direct application to leaves or trunks (esp, thin-barked trees)
• Always read label
• Hackberry is the “canary in the coalmine”
HAIL INJURY

- From a distance, tree foliage looks ragged and thinned out
- Usually one side of crown looks worse than others
- Up close inspection reveals multiple wounds
- Wounds usually all of the same orientation (upper side or same side)
EUROPEAN FLEA WEEVIL

- Leaf miner and chewer of elms, mostly Siberian
- European species
- Has exploded on the scene in CO over the last several years
- Adults are small weevils that “hop” like a flea
EUROPEAN ELM FLEA WEEVIL

ADULT VIEWS
(actual size about 1/8”)

LARVAL MINING AROUND LEAF EDGE

ADULT FEEDING INJURY
EUROPEAN ELM

FLEA WEEVIL

LARVAL MINING (MAY)

ADULT FEEDING (SUMMER)
MANAGEMENT OF ELM FLEA WEEVIL

• Probably not necessary, if tree mortality is the only concern and there are not additional stresses like extreme drought, leafminer, or elm leaf beetle.

• In cases where esthetics matter and/or there are other serious stresses:
  – Systemic application or foliar spray in late spring/early summer
  – Perhaps an additional foliar spray in mid-summer
  – Promote bird populations and proper watering
SAWFLY LEAFMINER OF ELM

- Fairly new
- Mostly aesthetic in impact
- Larval mining mostly May
- Would require systemic or foliar treatment early in the growing season
- Adults present in the weeks immediately after budbreak
- Following larval mining, larvae drop to ground and pupate in soil in early summer (beginning ~ June1)
STAGES OF SAWFLY MINING
(early at left, later at right)

eggs and early mines

mature larva within mine
ELM LEAFMINER
(Kaliofenusa ulmi)

- Used to be mostly minor miner (Am. Elm)
- Now a much more major minor
- ‘Mazing
- Much more common now in Siberian elm than it used to be
- Probably mostly an aesthetic issue
- Can be confused with elm leaf beetle
BIRD PREDATION ON ELM SAWFLY LARVAE LEAVING LEAVES TO PUPATE IN SOIL

These species (robin, starling, grackle) observed eating sawfly larvae under Siberian elm in my Fort Collins yard on 7 June 2009.
ELM LEAF BEETLE
(Xanthogaleruca luteola)

- Basically an every-year sort of issue
- Certainly worse some years, esp. late in summer
- Two generation/yr.
- Statewide, has not been as bad in the past decade (due to drought, competition, or what?)
- Still an issue locally in southeastern CO
URBAN BARK BEETLES OF DECIDUOUS HOSTS IN SECO

• ELM
  – Smaller Eur. Elm Bark Beetle (*Scolytus multistriatus*)
  – Banded Elm Bark Beetle (*Scolytus shevyrewi*)
• ASH
  – Ash Bark Beetles (few species in genus *Hylesinus*)
• HACKBERRY
  – Hackberry Bark Beetle (*Scolytus muticus*)
• FRUIT TREES
  – Shot-hole Borer (*Scolytus rugulosus*)
• BLACK WALNUT
  – Walnut Twig Beetle (*Pityophthorus juglandis*)
ELM BARK BEETLES

- Smaller European Elm BB
- From Europe 100+ years
- Being replaced by BEBB?
- Has been the major vector of DED in NA

- Banded Elm BB
- Recently from Asia
- Now the default elm bb
- Apparently a poor DED vector
ELM BARK BEETLE GALLERIES

SMALLER EUROPEAN

BANDED
DUTCH ELM DISEASE
SHOTHOLE BORER
(Scolytus rugulosus)

- Essentially our only bark beetle in fruit trees (cherry, plum, peach, etc.)
- Usually stress is the problem, not these bark beetles
- Paying attention to water/borer issues is best prevention
CONIFER BARK BEETLES IN SOUTHEASTERN COLORADO

- Mountain Pine Beetle, THE bark beetle issue in the mountains, is unlikely unless carried out here in firewood. Maybe rarely occurs in native ponderosa areas (Mesa DeMaya, se edge of Black Forest, etc.)
- Ips Beetles (few species, pines (including pinyon)
- Red Turpentine Beetle (planted pines)
- Cedar Bark Beetles (stressed junipers)
- Others (Twig Beetles, etc., uncommon)
IDENTIFICATION OF IPS

- Various species range from 1/16 to ¼ inch long (i.e., some as big as MPB)
- Adults all have spiny back ends (as opposed to rounded back ends of *Dendroctonus* spp.)
EXTERNAL IPS INFESTATION CLUES

- Rarely does ips produce pitch tubes
- Most common sign is boring dust in little piles within bark crevices
- Woodpecker activity may indicate where the problem trees are
IPS GALLERIES

• Multiple females involved, thus each gallery is branched or forked (result is a “Y” or “X” pattern)

• Galleries made by adults usually clear of frass
JUNIPER BARK BEETLES

- The so-called "Cedar Bark Beetles" in the genus Phloeosinus (pronounced "flee-oh-sign-us") are often found in very stressed junipers and cedars.

- Stress is the problem, not these beetles
CEDAR BARK BEETLES

(*Phloeosinus* spp.)

- Like ips, only in juniper hosts
WOOD BORERS

• Mostly beneficial
• Mostly “secondary”
• Usually best considered symptoms of the problem, not the actual problem
• Insects with this habit include beetles (longhorned and metallic wood borers), moths (carpenterworms, clearwings), and wasps (wood wasps/horntails)
EUROPEAN PAPER WASP

- Has increased in NA tremendously
- Depleting native butterflies?
- Found statewide
- Compare with native yellowjackets
OTHER ISSUES

- Pine Tip Moth (ornamental pines)
- Lilac-Ash Borer (small ash trees, common, confusion with EAB)
- Bacterial Wetwood (cause of ooze from many large deciduous trees)
- Pocket Gophers (mostly in windbreaks but occasionally in town, eat tree roots from underground)
- Army tanks?
DEER DAMAGE

- Deer damage trees by browsing, antler rubbing, and rarely bark gnawing
- Most nurseries carry lists of “deer-resistant” plants
- Effective management usually involves some form of physical exclusion like fencing
RABBITS

• Cottontails are the primary problem, snowshoe hares and jackrabbits less so
• Trap or exclude with mesh “guards”,
• Damage is two-fold:
  – Snipping of shoots at a 45-degree angle
  – Debarking (easily confused with mice/vole injury)
• Fox Squirrel is the primary urban squirrel in CO
• Other arboreal squirrels include Rock Squirrel, Abert’s Squirrel, and Red Squirrel
• People love ‘em, people hate ‘em.
FOX SQUIRREL DIET

- Tree buds
- Tree cones and fruits
- Tree inner bark
- Tree wound callous tissue
- Mushrooms
- Insect galls and the insects inside
- Bird eggs and babies
- Your lunch
- Roadkill
- Their own young!
- Pretty much everything plant or animal not included above
FOX SQUIRREL EATING MY BRAN MUFFIN
FOX SQUIRREL EATING LEAF-CURLING WOOLLY APHIDS ON ELM
FLAGGING IN COTTONWOOD FROM FOX SQUIRREL BRANCH BARK-FEEDING
Yes, in addition to all the other issues squirrels cause to trees, bird feeding operations, gardens, Halloween pumpkins, you name it, they also eat lots of eggs and kill nestling birds.
NEST & NEST LINER MATERIAL

USUALLY WET LEAVES AND GRASS

SOMETIMES INNER BARK OF WOODY PLANTS LIKE HONEYSUCKLE AND RUSSIAN OLIVE, STRIPPED FROM SHRUBS OR SUCKER BRANCHES
FOX SQUIRREL LIFE CYCLE

- Usually two broods of 2-3 young per year
- Nests are in tree hollows or leaf nests out on branches within tree crowns
- Breeding activity starts in early spring
- 2nd crop of young may not be out of nest until September
THOUSAND CANKERS DISEASE
OF WALNUT

• Caused by a fungus (Geosmithia morbida) vectored by a tiny bark beetle (Pityophthorus juglandis)

• Both organisms thought to be native to Southwest U.S.

• Discovered in early 2000’s to be killing planted Black Walnuts and other related species in many Western States, including CO

• This disease is a MAJOR threat to Black Walnut in Midwest
WALNUT TWIG BEETLE (*Pityophthorus juglandis*)
CROWN SYMPTOMS OF THOUSAND CANKERS IN BLACK WALNUT
THE FUNGUS-BEETLE CONNECTION
COALESCING CANKERS AT EACH BEETLE ATTACK
Distribution of TCD

- Positive J. nigra
- Positive J. major
- Negative J. major
- Negative J. microcarpa
CURRENT STATUS OF TCD

Colorado Counties in which Thousand Cankers Disease has been Detected
THE FUTURE

• Black Walnuts in CO probably are doomed, although it seems to be slowing down
• CO used to be considered biggest threat to major Midwest walnut resources, but intro into Tennesse takes us somewhat off the hook
• Still trying to understand how it got here (IF it was humans, maybe education/regulation can help, IF it was the wind, not much can be done)
EMERALD ASH BORER

IN COLORADO’S FUTURE?

YES!!!!
WHERE’D IT START IN U.S.?

Introduced in 1989-90 to Detroit area from Asian products shipped by St. Lawrence Seaway. It took about 23 years to work its way westward and reach Colorado.
WHERE IS EAB NOW?

23 U.S. STATES, 2 PROVINCES OF CANADA (6 more states probable)
EMERALD ASH BORER
EAB LARVA AND EARLY GALLERIES
EAB LARVAL GALLERIES

ALL FEEDING BY LARVAE IS JUST UNDER THE BARK
EXTERNAL SYMPTOMS OF EAB-INFESTED ASH

- EPICORMIC SPROUTS AT BASE
- DIEBACK IN CROWN
- BARK CRACKS
- WOODPECKERING
LIKELY PATHWAYS OF EAB INTRODUCTION TO THE WESTERN U.S.

• ASH FIREWOOD FROM MIDWEST

• ASH NURSERY STOCK

• OTHER ASH WOOD WITH BARK ON
EAB AS CLOSE AS YOUR NEAREST BIG BOX STORE?

- Major scare of late via ashwood planter boxes with bark attached being distributed by a major CO box store chain
- Problem dealt with?
- Introduction of EAB is that easy
GYPSY MOTH

- Hitch-hiking defoliator from the Northeast
- Detection traps placed annually throughout CO
FOREST INSECT & DISEASE REFERENCE BOOKS

Insects and Diseases of Woody Plants of the Central Rockies
(REVISION COMING SOON!!!)
(CSU Ext. Bulletin 506A)
970/491-6198 ($50)

Western Forest Insects by Furniss and Carolin (being revised)

Others (Cornell books, Kansas, Garden Insects, etc.)
“AND THANKS FOR CARING ABOUT TREES AND TRAINING TO BE A VOLUNTEER MASTER FORESTER!”