



Persistent Aphids and Leafhoppers

How to Diminish Them



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Common Tree Fruit Aphids in Utah

- Apple
 - Rosy Apple Aphid ✓
 - Green Apple Aphid* ✓
 - **Woolly Apple Aphid*** ✓
- Cherry
 - Black Cherry Aphid ✓
- Peach
 - Green Peach Aphid ✓
- Plum
 - Mealy Plum Aphid
 - Leaf Curl Plum Aphid



How to identify aphids:

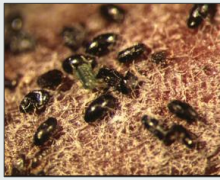
- green, black, pink, purple
- small, soft pear-shaped bodies
- slow moving
- pair of "tailpipes" – cornicles exude defensive fluid
- adults with & without wings

We'll look at their biology in two ways:

1. phenology in relation to tree development
2. life cycle & host plants

*Remain on fruit trees

Phenology: Rosy Apple Aphid & Green Apple Aphid



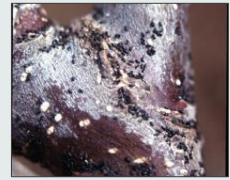
Monitor

eggs on limbs



Monitor

nymphs & adults on new growth



eggs on limbs

Stages of Development

Dormant	Green Tip	Half-inch Green	Tight Cluster	Pink	Full Bloom	Post Bloom	June	July	August	Sept.	

Rosy Apple Aphid

- Can be a severe pest of apple
- Early-season pest
- Severe leaf curling
- Fruit distortion
 - Inject a toxin when feeding
 - Affected fruit unmarketable



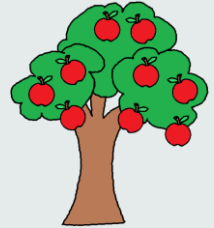
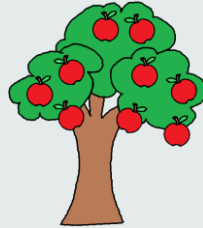
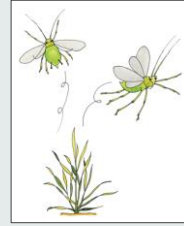
RAA are purplish with a waxy coating



Severe leaf curling & misshapen fruits

Rosy Apple Aphid

- Winged adults form in late spring
- Migrate to summer host
 - Plantain
 - Buckhorn plantain or ribgrass
 - Broadleaf plantain
- Winged adults form in fall
- Migrate back to apple trees
 - Lay eggs on fruit spurs and twigs
 - Shiny black "small grains of rice"



Green Apple Aphid

- Most common aphid in apple
- Other hosts:
 - pear
 - hawthorn
 - pyracantha
 - quince
- Infest succulent shoots
- Can feed on fruits
- Remain on apple throughout season



Yellow-green body with black cornicles



Feed on new growth

Management of Rosy & Green Apple Aphids

Green Tip to Half-Inch Green

- 2% Dormant Oil +
- Diazinon 50W (diazinon)
- Beleaf 50SG (flonicamid)
- Esteem 35WP (pyriproxyfen)



Post-Bloom

- Actara (thiamethoxam)
- Assail 30SG (acetamiprid)
- Admire Pro (imidacloprid)
- Sivanto 200SL (flypyradifurone)
- Ultor/Movento (spirotetramat)
- Esteem 35WP (pyriproxyfen)
- Leverage 360 (cyfluthrin/imidacloprid)
- Voliam Flexi (thiamethoxam/chlorantraniliprole)
- Lannate (GAA) (methomyl)
- Insecticidal Soap
- Neemix/Azatin (azadirachtin)
- 1 - 1.5% Horticultural Oil

Aphid Biological Control



Convergent Lady Beetle



Syrphid or Hover Fly



Green Lacewing

Brown Lacewing



Phenology: Woolly Apple Aphid



Monitor → Monitor

overwinter on roots, in bark crevices & on pruning scars

feed on limbs & fruits

twig & root galls

Stages of Development											
Dormant	Green Tip	Half-inch Green	Tight Cluster	Pink	Full Bloom	Post Bloom	June	July	August	Sept.	

Woolly Apple Aphid

- Can be a severe pest of apple
- Mid- & late-season pest
- Forms galls on roots & twigs
 - reduced tree vigor
 - stunted roots & trees
- Contaminate stem bowl of fruit



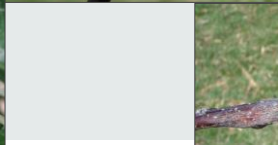
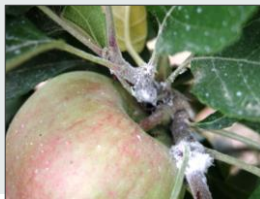
Root galls



Aphids covered in white woolly wax



Twig galls disrupt transport of nutrients & water



Woolly Apple Aphid Biological Control



Aphid mummies
Apelinus mali
parasitoid wasp of WAA

Aphid Predators:

ladybeetles
lacewings
syrphid flies



Alyssum planted to attract
syrphid flies to nectar & pollen

Management of Woolly Apple Aphid

- **Petal Fall**
 - Ultor/Movento (spirotetramat)
 - 1 or 2 applications (14-21 d)
- **Post-Bloom when WAA first observed**
 - Beleaf 50SG (flonicamid)
 - Diazinon 50W (diazinon)
 - Assail 30SG (acetamiprid)
 - 1 to 1.5% Horticultural Oil



Leaf surface available for
Insecticide contact/uptake



2019 Woolly Apple Aphid Trial Systemic insecticide combinations

- Exirel (cyantranliprole)
 - Lo – 10.3 oz/A + 0.24% LI 700 (soy-oil derived, non-ionic surfactant)
 - Mod – 15.4 oz/A + LI 700
 - Hi – 20.4 oz/A + LI 700
- Movento (spirotetramat)
 - Lo – 3.84 oz/A + LI 700
 - Mod – 5.76 oz/A + LI 700
 - Hi – 8.3 oz/A + LI 700
- Exirel + Movento – Lo + LI 700
- Exirel + Movento – Mod + LI 700
- Exirel Mod + Movento Lo + LI 700

'Fuji' apple orchard, 13-yr-old
USU Kaysville Research Farm
May 24 (max temp = 61.8°F)
Jun 12 (max temp = 85°)

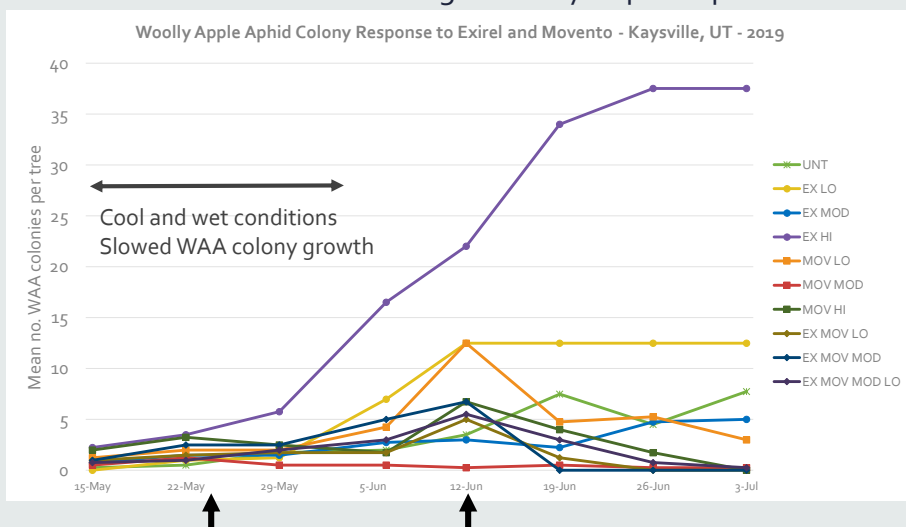


Unexpected results for Exirel:

Exirel Hi increased WAA colonies per tree (predator reduction?)

Movento Mod & Hi performed well in reducing WAA

Exirel combined with Movento did not significantly improve performance



WAA Colony Size Severity Rating – July 3, 2019

Treatment	Severity	Significant Difference
UNT	2.0	ab
EXIREL LO	1.25	b
EXIREL MOD	1.25	b
EXIREL HI	3.5	a
MOVENTO LO	0.75	b
MOVENTO MOD	0.25	bc
MOVENTO HI	0	c
EX MOV LO	0	c
EX MOV MOD	0	c
EX MOD MOV LO	0.25	bc

1 to 5 severity scale
 1 = small colony; 5 = colony expanding & spreading



Small WAA colony (1)



Multicolored Asian Lady Beetle



Large, spreading WAA colony (5)

Phenology: Green Peach Aphid Peach & Nectarine



Monitor

eggs on limbs



nymphs & adults on new leaves



adults fly to summer hosts



fly to peach trees
eggs on limbs

Stages of Development										
Dormant	Swollen Bud	1/4-inch Green	Pink	First Bloom	Full Bloom	Petal Fall	June	July	August	

Green Peach Aphid

- Yellow-green body with 3 dark green stripes on back
- Winged adult has black head & thorax, yellow-green body
- Severe leaf curling & honeydew
- Flowers & fruits abort
- Feed on nectarine fruits
 - Fruit bumpy & unmarketable
- Reduce shoot vigor, retard growth



Wingless & Winged GPA



Severe leaf distortion Damaged nectarine fruit

Management of Green Peach Aphid

- **Swollen Bud to First Pink**
 - 2% Dormant Oil +
 - Asana XL (esfenvalerate)
 - Diazinon 50W (diazinon)
- **Shuck Split**
 - Actara (thiamethoxam)
 - Admire Pro (imidacloprid)
 - Asana XL (esfenvalerate)
 - Closer SC (sulfoxaflor)
 - Assail 30SG (acetamiprid)
 - Leverage 360
 - Voliam Flexi
 - 1 – 1.5% Horticultural Oil
 - Insecticidal Soap



Biological Control!
(if it arrives early enough)
lady beetles, lacewings,
syrphid flies, predaceous bugs





Apple



Leafhoppers

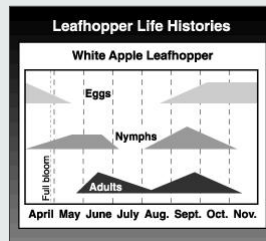
White Apple Leafhopper



Tart Cherry

Life History, Monitoring, and Management Timing

- Nymphs (25-30 days)
 - Susceptible life stage
 - Examine leaves or beating tray
 - Late instar nymphs – larger, look for wing pads
 - Target for insecticide application
 - 1st generation: apple – Sevin (carbaryl) fruit thinning sprays, first codling moth cover spray
 - 2nd generation: apple – avoid picker annoyance – mid- to late-August
- Adults (14 days to egg-laying; live for several months)
 - Nuisance to apple pickers
 - Target for control as numbers begin to rise sharply



Tar spot

Management of WALH

▪ Petal Fall

- Sevin 4F (carbaryl)
- Assail 30SG (acetamiprid)
- Avaunt (indoxacarb)
- Agri-Mek SC (abamectin)
- Centaur WDG (buprofezin)
- Danitol 2.4EC (fenpropathrin)
- Sivanto Prime (flupyradifurone)
- Surround WP (kaolin clay)

▪ Fruit Present

- Admire Pro (imidacloprid)
- Same as petal fall
- Aza-Direct/Azatin (azadirachtin)
- Insecticidal soap

