# New Insecticide Alternatives for Codling Moth Control In Apple

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*World Class. Face to Face.*

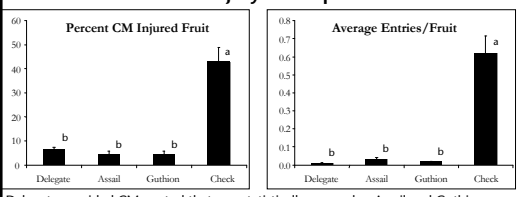
## DuPont Altacor WG
### *Rynaxypyr*

- Novel anthranilamide insecticide
- Mode of action: activation of insect ryanodine receptors - release of calcium from the muscle
- Good safety profile for environment, farm-worker, and natural enemies
- Active against codling moth and leafroller larvae
- First commercial sales anticipated in 2008

## Dow Delegate WG
### *Spinetoram*

- New spinosyn insecticide
- Mode of action: neurotoxin, causes rapid excitation of insect nervous system
- Good safety profile for environment, farm-worker, and most natural enemies
- Active against codling moth and leafroller larvae
- First commercial sales anticipated in 2008

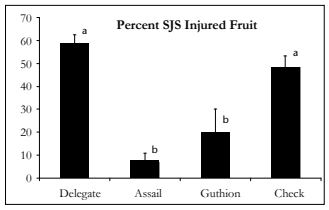
## Delegate Airblast Trial – 2006
### CM Fruit Injury – 5 September




Delegate provided CM control that was statistically as good as Assail and Guthion. Numerically, Delegate had fewer entries/fruit than Assail or Guthion. Delegate and Assail were applied three times/generation, Guthion was applied twice/generation.

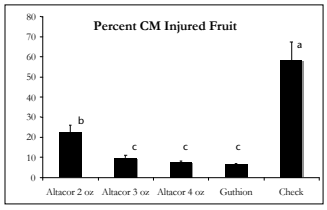
### Percent SJS Injured Fruit – 5 September

Trees infested with SJS produce small, immature apples and infested apples do not color properly. SJS kills twigs and limbs if not controlled.




Delegate did not appear to have any effect on San Jose Scale when applied against codling moth three times per CM generation.

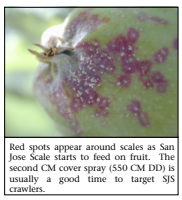
## Altacor Airblast Trial – 2006
### Percent CM Injured Fruit – 6 September



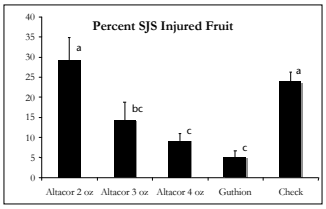

Codling moth larvae tunnel to the center of the apple to feed on seeds. Predictive models allow orchardists to target the larva before it enters the fruit.

Altacor applied at 3 and 4 oz/a rates provided CM control that was statistically as good as Guthion. Altacor and Guthion were applied twice per CM generation.

### Percent SJS Injured Fruit – 6 September



Red spots appear around scales as San Jose Scale starts to feed on fruit. The second CM cover spray (550 CM DD) is usually a good time to target SJS crawlers.



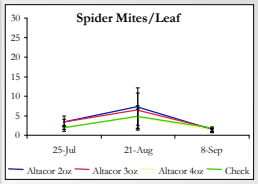

The higher rates of Altacor provided suppression of San Jose Scale fruit injury when applied against codling moth twice per CM generation.

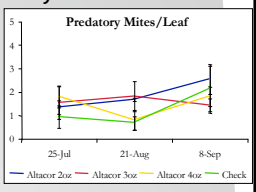
## Field Trial Methods

Field trials were applied to 5-tree plots replicated three times in a randomized complete block with a Rears PakBlast dual-tank airblast sprayer calibrated to deliver 100 gpa at 1.5 mph.

- Five-tree plots sprayed with airblast sprayer calibrated to deliver 100 gpa at 1.5 mph
- Each plot replicated three times in a randomized complete block design
- Buffer rows used to avoid overspray and drift
- Fruit injury evaluations made at the end of each CM generation
- Mite samples taken at regular intervals during summer months
- Applications began ca 250DD/1250DD for 1st and 2nd CM generations and repeated based on anticipated residue life of the product applied
- Degree-days (DD) were accumulated after first moth capture in pheromone baited traps (biofix), and calculated from daily maximum and minimum temperatures
- Data were analyzed using a one-way ANOVA, mean separation was by Student's t (p=0.05)

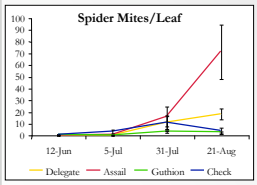
## Altacor Airblast Trial – 2006
### Pest and Predatory Mites

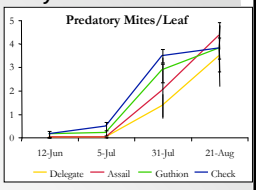



Altacor was applied twice per CM generation for a total of four applications. There were no apparent effects on either spider mites or predatory mites.

## Delegate Airblast Trial – 2006
### Pest and Predatory Mites




Delegate was applied three times per CM generation for a total of six applications. A slight suppression in the number of predatory mites in the Delegate treatment resulted in a slight increase in the number of spider mites.

## Summary

Mites feed by inserting their mouth parts into leaf cells to suck out the contents. Stippling and, later, bronzing can occur. Apples can tolerate a high number of pest mites and economic injury level may be set at 30 mites/leaf when predatory mites are present.

- Altacor (DuPont) and Delegate (Dow) will both be very useful additions to Washington apple IPM programs for control of codling moth and leafroller.
- Altacor and Delegate both have good safety profiles for environment, farm-worker, and most natural enemies.
- Altacor is a novel mode of action which will help with resistance management.
- Delegate is a spinosyn insecticide – same class of chemistry as Success.
- Altacor and Delegate must be consumed by CM or LR larvae to be effective – good application timing and coverage will be very important.
- Altacor has a long residue life and provided good CM control when applied at 21d intervals in 2006 field trials.
- Delegate has a shorter residue life and provided good CM control when applied at 14d intervals.

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