

Eco Apple Protocol Quick Guide V 4.2 – FOR 2008 SEASON – 03/28/08

This guide is designed to make it easier for growers to quickly access information based on apple growth stages. **Other factors remain critically important.** These include scouting and trapping, monitoring weather, and using a season-long approach. **It will not be necessary to take actions at every growth stage.** There may be other products available that are not listed here, and not all products listed here may be available in every state. **FOLLOW YOUR STATE REGULATIONS AND ALL LABEL INSTRUCTIONS.**

CHANGES FOR 2008

1. Addition of Esteem at half-inch green, Actara at pink and Provado at petal fall for rosy apple aphid.
2. Additional information re supplementing mating disruption for codling moth with insecticide sprays, and on use of granulosis virus for codling moth during moth flights.
3. Addition of Actara post-bloom for plum curculio.
4. Addition of Provado for Japanese beetle.

STAGE	PEST AND MATERIALS	AMOUNT
Dormant to Silver Tip	Fire blight Copper	
	Kocide 2000 (copper hydroxide).....	4 lb. per 100 gal.
	OR C-O-C-S (copper oxychloride)	4 lb. per 100 gal.
	OR Cuprofix Disperss (complexed basic copper sulfate)	6.6 lb per 100 gal.
	OR Champ Flowable (copper hydroxide)	2 qt. per 100 gal.
	OR Bordeaux mix 8-8-100 plus oil	8 lb. copper sulfate 8 lb. spray lime 1 qt oil per 100 gal.
	Early-season copper applications may reduce inoculum of some other diseases.	
Green Tip	Fire blight Although late dormant or silver tip application of copper is preferable, if none one was made it can be made at this time.	
	Apple scab Copper applications offer limited protection against apple scab for 5 to 7 days in those orchards with low inoculum, e.g., without significant scab the previous season. (For accurate determination of inoculum levels, use the Potential Ascospore Dose method in the Fall.) Copper is recommended as the first choice for orchards with low inoculum . See rates for Fire Blight above.	
	In orchards with significant scab the previous season, Vanguard (cyprodinil) OR Syllit (dodine) is recommended as the first choice . (Syllit should not be used where resistance is suspected.) An FRDC	

	OR Polyram 80 DF	3.2 lb/A max) 1 lb. per 100 gal. (up to 3.2 lb/A max)
	OR Manex 4F.....	0.8 qt. per 100 gal.
Half-inch Green	Apple scab Options the same as at Green Tip, except DO NOT USE COPPER.	
	Mites, Scale Oil	2 gal. per 100 gal.
	Rosy Apple Aphid (timing is critical for effective control) Esteem 35 WP	3-5 oz. per acre
Tight Cluster	Apple scab When using Flint or an SI (Nova, Procure or Rubigan), be aware of resistance management limitations. Do not make back to back applications of Flint. Apply SI's with an EBDC. Do not use SI's two seasons in a row. Do not apply any SI's or Flint more than four times per season as per the Protocol. Do not apply SIs if the orchard has known SI resistance or previous control failure with SIs. Do not use Captan within 10 days of an oil application.	
	Flint 50WDG	0.67 oz. per 100 gal.
	OR A COMBINATION OF EITHER Nova 40WP	2 oz. per 100 gal.
	or Procure 50WS	4 oz. per 100 gal.
	or Rubigan 1EC	4 fl. oz. per 100 gal.
	PLUS EITHER Dithane/Manzate/Penncozeb 75DF/80WP.....	1 lb. per 100 gal. (up to 3.2 lb/A max)
	or Polyram 80 DF	1 lb. per 100 gal. (up to 3.2 lb/A max)
	or Manex 4F.....	0.8 qt. per 100 gal.
	Mites or San Jose Scale If needed Oil.....	1 gal. per 100 gal.
	OR FOR MITES ONLY Envidor 2SC (limit one application per season, not avail in NY)	16 – 18 oz. per acre
	OR Zeal 72 WDG (for mites only, limit one application per season) ..	2 – 18 oz. per acre
	OR FOR SCALE ONLY	

	Mites If needed, same as Tight Cluster	
	Rosy apple aphid Actara 25 WDG	4.5 fl. oz. per acre
	Tarnished plant bug If needed, same as Tight Cluster	
Bloom	Apple scab Schedule is very similar to Tight Cluster except that Captan may be used alone or in combination with an SI. Do not use Captan within 10 days of an oil application	
	Captan 50WP	2 lb. per 100 gal.
	OR Captan 80WP	1.25 lb. per 100 gal.
	OR Captan 4L	1 qt. per 100 gal.
	OR Flint 50WG	0.8 oz. per 100 gal.
	OR A COMBINATION OF EITHER	
	Nova 40WP	2 oz. per 100 gal.
	or Procure 50WS	4 oz. per 100 gal.
	or Rubigan 1EC	4 fl. oz. per 100 gal.
	PLUS EITHER	
	Dithane/Manzate/Penncozeb 75DF/80WP	1 lb. per 100 gal.
	or Polyram 80 DF	1 lb. per 100 gal.
	or Manex 4F	0.8 qt. per 100 gal.
	or Captan 50WP	1 lb. per 100 gal.
	or Captan 80WP	0.625 lb. (10 Oz.) per 100 gal.
	or Captan 4L	1 pt. per 100 gal.
	Fire blight NOTE: Streptomycin must be applied for fire blight only according to a weather-based forecasting program such as Maryblyt or Cougarblight.	
	BLOSSOM BLIGHT Streptomycin	
	Agrimycin 17WP	0.5 lb. per 100 gal.
	OR Firewall 17WP	0.5 lb. per 100 gal.
	OR Streptol 17WP	0.5 lb. per 100 gal.
	OR A COMBINATION OF	

If in 2 – 4 days a third application is needed, repeat streptomycin (Agrimycin, Firewall or Streptol, see rates above)

SHOOT BLIGHT (late bloom or early petal fall)

Prohexadione calcium

Trees > 5 years old

Apogee 27.5DF* 6 oz per 100 gal.

Trees < 5 years old

Apogee 27.5DF 3 oz per 100 gal.

*To be effective, Apogee must be applied well before shoot blight will first appear. Therefore Apogee should be used only if blossom infections are severe or if a history of fire blight in the block the previous year suggests a high risk of shoot blight.

NOTE: After bloom, applications of streptomycin for fire blight must be made only in the event of hail or high wind damage in orchards with existing infections.

Codling moth: Pheromones for mating disruption

Isomate CTT 200 ties per acre

OR Checkmate CMF..... 2.4 - 4.8 fl oz per acre

Apply pheromone mating disruption before initiation of moth flight (e.g., bloom for first generation, by late June for second generation); supplemental insecticide sprays timed to coincide with egg hatch will likely also be needed and may include border sprays in blocks adjacent to sources of adult immigration or other high-pressure situations.

Obliquebanded leafroller: If needed, based on >3% infested blossom clusters.

Dipel 10.3DF..... 0.5 – 2.0 lb per acre

OR Agree WG 3.8WS..... 1 – 2 lb per acre

OR Intrepid 2F..... 8 – 16 fl oz per acre

Petal Fall	<p>Apple scab: Same as bloom EXCEPT DO NOT USE EBDCs AFTER BLOOM if you use miticides other than oil. Avoiding EBDCs after bloom will preserve predators.</p> <p>Mites: Make no more than two post-bloom miticide applications per</p>	
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	<p>Plum curculio, European apple sawfly: If needed Actara 25WDG Avaunt 30WDG OR Calypso 4F</p> <p>Note: Sevin applied as a thinner may also have some benefit for Plum Curculio control but must not be applied unless for thinning purposes.</p> <p>Obliquebanded leafroller: If needed based on $\geq 3\%$ infested blossom clusters (Only if not treated at bloom.) Intrepid 2F OR Proclaim 5SG OR Agree WG 3.8WS..... OR Dipel 10.3DF.....</p> <p>Rosy apple aphid Provado 1.6 Flowable</p>	<p>4.5-5.5 oz. per acre 5 – 6 oz. per 100 gal. 1 – 2 oz. per 100 gal.</p> <p>12-16 fl. oz per acre 0.8–1.2 oz per 100 gal 1 – 2 lb per acre 0.5 – 2 lb per acre</p> <p>8.0 fl. oz. per acre</p>
<p>First Cover</p>	<p>Apple scab: Same as Petal Fall</p> <p>Plum curculio: Same as Petal Fall, except after the 1st application for plum curculio, base any additional treatment decisions on scouting for fresh injury and/or a degree-day based oviposition model. After the first application for plum curculio, use perimeter row sprays rather than whole block treatments. <i>Note: For trees less than 7 ft. in height, or where scouting indicates fresh injury in the interior of a block, full block applications may be made.</i></p> <p>Codling moth: If needed based on block or region history. Assail 30 SG</p> <p>(First treatment applied at 250 degree days (base 50) after the first sustained pheromone trap catch (biofix). If pressure is severe as indicated by pheromone traps or fruit damage, an additional application may be made 10-14 days later.)</p> <p>OR Carpovirusine 0.99SC (for codling moth only)..... OR Cyd-X 0.06SC (for codling moth only).....</p> <p>These products contain granulosis virus which specifically attacks codling moth larvae and work well in combination with mating disruption. They must be applied starting at first egg hatch and every 7-8 days during the moth flight, or about 4 applications per generation. Multiple applications at low rates are preferred.</p>	<p>4-8 oz per acre</p> <p>0.5 – 1 pt per 100 gal 3 fl oz per acre</p>

	July to August) with a second application 14 days later.)	
Second Cover	<p>Sooty blotch and flyspeck: Do not treat unless need is indicated by previous history and/or weather monitoring for wetting hours. Do not apply fungicides for summer disease until 270 wetting hours have accumulated since petal fall, or if wetting data are not available, early-July may be used as an estimated date.</p> <p>Flint 50WG 0.67 oz. per 100 gal. OR Captan 50WP 1 lb. per 100 gal. OR Captan 80WP 0.625 lb. (10 oz.) per per 100 gal. OR Captan 4L 1 pt. per 100 gal.</p> <p>OR A COMBINATION OF Topsin M 70WP* 3 oz. per 100 gal. PLUS EITHER Captan 50WP 1 lb. per 100 gal. or Captan 80WP 0.625 lb. (10 oz.) per 100 gal. or Captan 4L 1 pt. per 100 gal.</p> <p>* Use Topsin M only where summer disease pressure is heavy indicated by block history.</p> <p>Plum curculio: See First Cover</p> <p>Codling moth: See First Cover for insecticide options Pheromone disruption (including Oriental Fruit Moth): For best results, make applications before the start of summer generation moth flights</p> <p>Isomate-M 100 (oriental fruit moth)..... 100 ties per acre OR Isomate-C TT (codling moth)..... 200 ties per acre OR Isomate-CM/OFM TT (both species)..... 200 ties per acre OR Checkmate OFM-F (oriental fruit moth)..... 1.3 – 2.9 fl oz per acre OR Checkmate CM-F (codling moth)..... 2.4 – 4.8 fl oz per acre OR Checkmate CM-OFM Duel (both species)..... 100 – 150 disp per acre</p> <p>Japanese beetle Provado 1.6 Flowable..... 8.0 fl. oz. per acre</p> <p>Multiple applications may be needed. Spot treatments should be considered where activity is limited within the orchard. Applications limited to the top of the canopy where feeding is occurring may be effective. Sample to determine if broad spectrum insecticides (Assail, Avaunt, Calypso) applied for other pests, e.g., apple maggot, codling</p>	

OR Captan 80WP	0.625 lb. (10 oz.) per 100 gal.
OR Captan 4L	1 pt. per 100 gal.
OR A COMBINATION OF Topsin M 70WP*	3 oz. per 100 gal.
PLUS EITHER Captan 50WP	1 lb. per 100 gal.
or Captan 80WP	0.625 lb. (10 oz.) per 100 gal.
or Captan 4L	1 pt. per 100 gal.
*Use Topsin M only where heavy apple scab or summer disease pressure are indicated by scab severity or block history of summer diseases.	
Table A. Activity of fungicides against summer diseases	
Fungicide	
Rate per 100 gal.	
Minimum interval (days)	
Maximum rainfall (in.) during interval	
Topsin M <i>plus</i> Captan 50WP	
3 oz	
1.0 lb	
21	
2.5	1 – 2 lb. per acre 0.5 – 2 lb. per acre 2.5 oz per 100 gal 0.8–1.2 oz per 100 gal
Captan 50WP	
1 lb	
14	
2.0	
Flint 50 WDG	
0.67 oz.	
21	

	<p>OR Spintor 2SC.....</p> <p>OR Proclaim 5SG.....</p> <p>Follow-up sprays are recommended 10-14 days later to ensure contacting most larvae of the 1st summer generation.</p>	
<p>After Third Cover</p>	<p>Sooty blotch and flyspeck: Same as Third Cover except that a third summer disease application may be made only as per Table A above.</p> <p>Apple Maggot: Base applications on monitoring traps (threshold of ≥ 1 for unbaited spheres or ≥ 5 for baited spheres) or use trap-out spheres</p> <p>Assail 30SG.....</p> <p>OR Avaunt 30WDG</p> <p>OR Spintor 2SC</p> <p>OR Surround WP [Frequent applications (7-10-day intervals) and maximal coverage (minimum of 100 gal/A are advised while there is active foliar growth)].....</p> <p>Codling moth and Oriental fruit moth: Base applications on trap catch (1st adult flight biofix) and DD developmental models (CM: 250 DD base 50F from biofix; OFM: 170 DD base 45F from biofix), plus follow-up application 10-14 days later for each brood.</p> <p>Assail 30SG.....</p> <p>OR Avaunt 30WDG</p> <p>OR Intrepid 2F.....</p> <p>OR Carpovirusine 0.99SC (for codling moth only).....</p> <p>OR Cyd-X 0.06SC (for codling moth only).....</p> <p>Mites: Make no more than two post-bloom miticide applications per season.</p> <p>Acramite 50WS (limited to 1 application per season).....</p> <p>OR Envior 2 SC (limit one application per season)</p> <p>OR Kanemite 15SC (limited to 2 applications per season).....</p> <p>OR Zeal 72WS (limited to 1 application per season).....</p> <p>White apple leafhopper:</p> <p>Assail 30SG.....</p> <p>OR Avaunt 30WDG.....</p> <p>OR Provado 1.6F.....</p> <p>Woolly apple aphid:</p> <p>Assail 30SG.....</p>	<p>8 oz per acre</p> <p>5 – 6 oz. per acre</p> <p>2.5 oz. per 100 gal.</p> <p>25 – 50 lb per acre</p> <p>8 oz per acre</p> <p>5 – 6 oz per acre</p> <p>12 – 16 oz per acre</p> <p>0.5 – 1 pt per 100 gal</p> <p>3 fl oz per acre</p> <p>0.75 – 1 lb per acre</p> <p>16 – 18 oz per acre</p> <p>31 fl oz per acre</p> <p>2 – 3 oz per acre</p> <p>2.5 – 4 oz per acre</p> <p>5 – 6 oz per acre</p> <p>0.5 – 2 oz per 100 gal</p> <p>4 – 8 oz per acre</p>