GROWERS FIELD GUIDE, May 2008

OK, in the past two years the spring has been peaches and cream. Not the case this year! At the time I am writing this, the weather has taken a turn for the worse and the upcoming weekend doesn't look good. The potential for problems could be high and only time will tell what it will mean. I am reminded of a joke that I heard once. It went something like this: A young ATF officer had been doing some research on a family in Arkansas that he knew was producing moonshine. He had spent many hours working on locating the actual spot that the still was located and he was pretty sure that he had it figured out. He worked his way back into the deep woods and sure enough he came upon a small house with a 10-year-old young boy on the porch. He told the young boy that he wanted to speak to his father and his brothers. The young boy told him that he didn't know where they were. The ATF officer told the young boy he would give him $10.00 to take him to the others. The boy didn't say anything. The ATF officer spoke again to the boy and said, "Will you take me to your family?" The boy said, "Where is the $10.00?" The ATF officer said, "I will pay you when we get back." The boy said, "You need to pay me now. Because if I take you to them, you aren't coming back!" Ok, you get the picture. I guess the moral of what I am laying out is that we can't look back on what we are doing to grow our crops. We can only look to the future and adjust accordingly.

Let's get down to business!

Recheck your sprayer calibration if you've used a lot of Surround this spring. A thousand pounds or more through a single sprayer could have a set of brass discs eroded out by 10% or more. That could mean $25 to $35 more per acre for the rest of the season if you don't correct it now.

I have freely copied and adapted information from various Research and Extension personnel and publications plus the experiences of the Fieldstaff at Northwest Wholesale for the information presented in this Growers Field Guide. Any errors in presenting that information are entirely mine. If you spot an error, please notify me so that they will not be repeated.

All material usage information supplied in this bulletin is believed to be in compliance with current labels. It is the responsibility of the grower to insure that use of any material is in compliance with the label on the product in his possession! <u>All material rates in this bulletin are shown per acre except those products where concentration of material is important.</u>

All of the monitoring aids mentioned in this bulletin and research information on most of the insects and diseases mentioned are available through any Northwest Wholesale warehouse.

Nathan Squires, Field Services Manager.

Tel. 509-662-2141, Toll free, 800-874-6607 email, nates@nwwinc.com

Can I Help You?

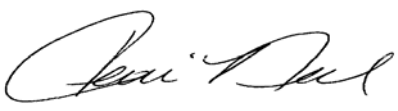
If you need more information on what you bought and when you bought it — I can supply it. Whatever you need — a year, a month — from 1996 to yesterday!

I can do this for any account — personal or buying through a warehouse — it doesn't matter.

If you are managing several different blocks or locations and want to separate your purchases, I can arrange that also. I can set up as many secondary "ship to" accounts as you need to keep track of where you are spending your money.

After that you just tell our warehouse personnel which location you want charged

If you have questions about our credit policy, billing procedures, etc, give me a call. I'm here to help you in any way that I can.



Terri Neel @ 509-662-2141 or 1-800-874-6607

Container Recycling

Pesticide container recycling will be the same as last year. Bring in your empty, rinsed containers anytime during normal business hours. Northwest Wholesale will accept properly rinsed containers at all locations ***<u>except Tonasket</u>*** (Don doesn't have the room). The warehouse personnel will inspect them before acceptance. The container must be clean and dry, some staining is allowed. The plastic labels must be slipped off, the jug cap removed and any instruction booklet removed.

We will also accept plastic drums and tanks up to 500 gallon in size. There is a poster on display at all locations with pictures and detailed instructions on container cleaning.

Northwest Ag Plastics has informed Northwest Wholesale that we the only orchard chemical dealer in NCW that is willing to accept pesticide containers for recycling. We are also designated by Douglas County as the Pesticide Container recycling collection site for the East Wenatchee area. If you prefer to deliver directly to the chipper check http://www.nwagplastics.com/ for a local schedule.

Spring weed control

If past years are any guide, that first extended period of warm weather will probably catch most of you by surprise. This year it will be gladly accepted. If you were planning on having more time to get prepared for your first weed spray, you are starting the season behind — again.

Here is a repeat of the April weed control article just to remind you that the weeds are still growing rapidly whether you've had time to pay attention to them or not.

Residual herbicides require 1/4" or more of water to incorporate them into the soil, just prior to the first irrigation is a good time to apply any residual herbicide you missed last fall. Spring applied residual herbicides typically do not last as long as a fall application but will give you much longer control than a contact application alone. An early May applied contact herbicide alone with lots of weed seeds in the ground may give you three weeks of control, the addition of residual compounds should give you about eight weeks of control. Casaron will **not** give satisfactory control when spring or summer applied without specific treatment, contact the nearest Northwest Wholesale warehouse for instructions. Control of growing weeds will require the addition of **glyphosate** (Credit) or **Gramoxone Inteon and a surfactant** to the mixture. Avoid spraying the trunks of trees smaller than 2" in diameter with glyphosate to avoid damage.

APPLE

Rosy Apple Aphid

Every year I get reports of Rosy Apple Aphid showing up prior to first codling moth cover in numbers that make growers and fieldmen uncomfortable. By that time they are difficult to control because they are tightly sheltered in the rolled up leaves. If you have a history of Rosy Apple Aphid infestation and want to avoid it this year, apply **Provado** at 6 – 8 ounces per acre at or shortly after petal fall. Include ½ pint of Regulaid **or** 1 ounce of Silwet per 100 gallons. If you are planning on **Assail** for codling moth first cover that will also control the aphid complex.

Perennial Canker

The blossom infection shows up in storage as calyx or core rot. Lenticle infections develop the characteristic decay spot on the side of the fruit with a lighter margin that causes the name 'Bull's Eye' rot. Perennial canker is mostly found in older blocks of with damage to the scaffolding from pruning, sun or winter. Water from rain and overhead irrigation or cooling will increase the spread of the disease. If you are farming an older block and decay was a factor in your cullage, apply 5 lbs. of **Ziram WDG** at petal fall. After the calyx closes it is too late. Additional control will be needed mid to late August to prevent lenticle infection.

Botrytis

This infection may appear pre harvest and in storage, especially in the later harvested and high sugared varieties such as Fuji. Work has not been done to prove the infection timing for this organism. My guess is that most Fuji blocks are not being specifically treated at the petal fall stage for perennial canker. Any blossom infection by botrytis at this time could lay dormant in the calyx area and begin developing near or after harvest as the sugar levels in the maturing fruit rise. Growers that have had storage rot should consider a petal fall treatment for perennial canker and botrytis.

White Apple Leafhopper

The first generation emerges shortly after bloom from eggs laid in the bark of the younger wood the previous fall. The early stages usually shelter and feed on the back of the leaf. This feeding is noticeable from the top of the leaf as a white speckling beginning at the base of the leaf and along the main vein. These early stages are easy to monitor by turning over the leaves in the lower center of the tree. The nymph is light colored, wingless and except for the very youngest easily seen without a hand lens. By the time of the first Codling Moth cover they have developed wings and fly quickly from leaf to leaf when

disturbed, landing with enough force to be easily heard. This flight habit distinguishes them from the leafminer, which also flies when disturbed but with a slow fluttering pattern and lands silently. A large population of leafhopper will bleach the older leaves on a tree nearly white and will reduce fruit size and color. On young trees the growth will be reduced.

Carbaryl used for thinning at 10 mm and larger fruit is usually adequate for first generation control. A single carbaryl used for thinning at petal fall is too early to give good control. If carbaryl is not used for fruit thinning you will probably need to apply either **Thiodan 50WP** @ 4 lbs. per acre or **Provado** @ 3 - 4 oz. per acre before first cover timing to avoid heavy feeding damage.

The first generation of leafhopper lays it eggs in the leaf tissue and dies by early to mid June with the second generation beginning to emerge early to mid August. More in the August issue.

First Generation Codling Moth — conventional

Codling moth control begins with your post bloom leafroller control. **Intrepid** @ 16 ounces per acre applied at 100 - 150 degree days post biofix (late petal fall) provides excellent control of leafroller (in some instances for all season), good residual control of Lacanobia, and up to 14 days of codling moth control. If leafroller is your main target, spray at 100 degree days**. Rimon** @ 32 ounces per acre is also effective at this timing.

If you don't need post bloom leafroller control, the first Codling Moth cover must be timed by the Codling Moth model to be efficient and effective. It usually consists of **Guthion 50WP** @ 2 lbs. per acre for codling moth, **MIRACALsp** @ 5 lbs. per acre **(**or **Calcium Chloride** @ 3 lbs. per 100 gallons or 6 - 8 lbs. per acre if you spray concentrate), with aphid control as needed. **Guthion (Azinphos) has a 14-day REI at the 2# rate**. If you can't manage with that, use **Imidan 70WSP** (REI 24 hrs.) at the top label rate. Less material will not provide more that 12 to 14 days of control **Assail** @ 3.4 ounces per acre should be used at the same timing for control similar to Guthion with a second application 16 to 20 day later, depending on pressure. Monitor spider mite populations closely after using Assail. Add Nufilm 17 for rainfastness, one pint per acre concentrate, ½ pint per hundred dilute.

If you plan to use an Insect Growth Regulator material such as **Esteem, Intrepid or Rimon** to supplement your mating disruption program, your timing is different. **Esteem@** 5 oz./acre, **Intrepid @** 16 oz./acre or **Rimon** @ 32 oz./acre, should be applied at 100 degree days post biofix (late petal fall) and again 14 to 21 days later. **Esteem** works best if applied before the codling moth egg is laid (late petal fall), **Intrepid and Rimon** may be applied after the egg is laid but before hatch (250 degree days).

On mildew sensitive varieties a fungicide (**Flint, Rally, Rubigan, or Procure**) is frequently added, especially if new tip infections are fairly easy to find. .**Captan 50WP** or **Kumulus Sulfur** are also used for fruit finish on Gala, Golden and Fuji. Do not use micronized sulfur if temperatures are above 85 degrees. If substantial rain occurs within 10 days of this cover you will not have residual enough to protect you from codling moth for a full 21 days and must respray soon after the rain to maintain protection.

Growers using mating disruption must insure that they have control of the first generation. If there was any codling moth damage at harvest last fall, a single cover of either **Guthion** or **Imidan** at the peak of egg hatch should be considered a minimum supplement. Areas around active traps should have two covers.

See the March issue (Trapping, pg. 5) for effective trap placement. Growers using either **Scentry fibers** or **Suttera CheckMate CMF** should be using one X lures or the new combination lure instead of ten X lures in the traps. Growers using less than a half rate of dispensers should use one X lures or the new combination lure in about half of their traps. A total catch of 3 moths in a single trap during the first 4 to 5 weeks of the first generation is commonly considered a spraying threshold. If an additional 3 moths are caught in the next three weeks, a second cover will be needed.

In non mating disruption blocks, a second cover, applied not more than 3 weeks after the schedule described above, must consider the possibility of needing control for aphid and possibly leafroller (see post bloom leafroller section). Leafminer should be considered separately if possible (see leafminer section). Spider mite populations should be monitored, especially if you have used **Assail**. Most orchards are well controlled by predatory mites but you don't want to be surprised.

Aphid control is **Provado** @ 3 - 5 oz. per acre with 2 - 4 oz. of **Silwet** per 100 gallons. The higher rate of Silwet normally lets you use the lower rate of Provado. **Assail** for codling moth will control aphids. If leafroller control is needed at second cover, use **Success** @ 6 oz. or **Intrepid** @ 12 oz. per acre with 1 gallon of oil, 200 gallons per acre. The initial knockdown is usually faster with **Success**. Do not mix oil and Silwet; the oil will also enhance the Provado.

If you are not familiar with most of the predator insects in your orchard, **PNW 343 Beneficial Organisms Associated with Northwest Crops** has good color pictures of some the critters you should get acquainted with. It's available on the net or ask a Northwest Wholesale, Inc. warehouse to get a copy for you.

First Generation Codling Moth — Sprayable Pheromone

The recommended rate is 2 ½ to 5 ounces per acre per application. No significant difference in control is apparent between these two rates. Control drops off sharply below 2 ½ ounces per acre. Growers are beginning to experiment with very low application rates, 50 gallons per acre or less with a sticker such as Nufilm 17 to place and keep as much of the material in the upper ½ of the tree canopy as possible. The manufacturer is planning to use an applicator similar to that used for cherry fruit fly control with GF 120. We will let you know this winter how that is working.

What you want to accomplish will determine when you will apply the material, there are several options with this application method. If you want a full mating disruption program without the labor of applying hand dispensers, make the first application at biofix, generally full bloom on Red Delicious. A second application will be needed at 28 days or when you monitoring traps begin catching moths. Second generation applications only last 21 days because of the more intense sunlight. This program will require the same degree of supplementation as a No-Mate or Isomate program.

If your goal is to supplement or increase the effectiveness of your conventional spray program, tank mix 2 ½ ounces per acre with the first codling moth cover of each generation. The pheromone will restrict mating during the time it is most active while the Azinphos in the tank mix will control the larva and fertile moths already in the orchard. The intent is to reduce the population below what Azinphos alone would be able to do.

If your goal is to put maximum effort into controlling the first generation in hopes you will not need to spray a second generation — apply 2 ½ ounces per acre at petal fall with Intrepid, again at normal first cover timing with a chemical control, then again 21 days later with another chemical control. Monitor the second generation closely and only spray if needed.

The pheromone capsules will adhere to almost anything, windbreaks, bin piles, buildings, etc. If you have the room you can build a pheromone border OUTSIDE our orchard to alleviate some of the border mating common with hand placed dispensers.

Important. Trap monitoring in a sprayable pheromone block must be done with one X lures, **not** ten X lures!

Post bloom Leafroller

If you had any Leafroller damage at harvest last fall you will not get season long control from a delayed dormant Lorsban. One or more post bloom sprays are normally needed for complete control of leafroller with Bt. Apply a post bloom Bt (**Dipel, Deliver, or MVP II)** during a period when the daytime temperature will be 65 degrees or more. You may combine that with almost any other material to save a trip through the orchard.

Intrepid is a useful resistance management tool to prolong the useful life of Success and at the 16-ounce rate may serve as your first codling moth cover if applied at 100 – 150 degree days post biofix. The **Success** label does not allow for use on more than two consecutive generations of leafroller. If you applied Success mid summer last year, switch to Intrepid this spring.

Success (if you did not use it twice last year) is very effective against leafroller when used at petal fall. Good coverage is essential, 8 ounces of material per acre does well. Two applications of Bt are about the same cost as a single **Success**. If you also want maximum leafminer control, add ¼% oil to the mix. (see leafminer section)

Proclaim is a good choice to use at this timing as well. Proclaim is fairly new and has shown excellent control of leafroller. The rate for Proclaim is 4.8 oz. Per acre.

Esteem@ 5 oz./acre, applied at 100 degree days post biofix (late petal fall) and again 14 to 21 days later for codling moth control in mating disruption blocks provides good leafroller control of the summer generations by blocking successful pupation of the over wintering generation that was treated. Esteem does not directly kill large larva, they continue to develop to the pupal stage. If your over wintering population is large enough to directly cause economic damage, i.e. you can't easily remove the damage while thinning and still have a full crop, apply Intrepid or Success to stop the possibility of damage increasing after application.

The female Leafroller does not fly very far from where she emerges so low pressure populations are usually very spotty, you must look at several locations in the orchard to determine what you have. This characteristic also works in your favor.

When you do a thorough job of controlling the first generation you will not be rapidly overrun from outside pressure. Monitoring is essential!

Less than the best control of the overwintering generation (you could still find an occasional larva) means that you will probably start controlling the first summer generation with the second cover codling moth spray sometime in June. If you

achieved very good control (you can see where they were but can't find any live ones) your timing for effective control is probably closer to the second generation of codling moth in July. Unfortunately there is no reliable method of trapping to monitor for either population levels or emergence timing for small (20 - 30 acre) blocks. Unlike the female Leafroller the male will move long distances in response to a pheromone lure, the catch in your trap could be from any one of your neighbors.

It is very time consuming to search for newly hatched Leafroller larva in the center of the tree. My method is to walk slowly along the row looking at the upper terminals against a bright sky. Any thin spot in the leaf caused by the feeding of the young larva will be very easy to see, even an area the size of match head. You need to carry a pole pruner or some other means of getting some of the terminals down where you can examine them, there are other conditions and insects that will also make holes in the terminal leaves. A Leafroller larva will have a shelter of webbing built against one of the major veins of the leaf before it is large enough to roll the leaf. When you find these it is time to begin your summer control program.

Leafminer

This is a mostly cosmetic, sometimes pest. This year you have it, most years you don't. The first generation is usually unnoticed unless populations are very high. Most of the egg laying is done on the primary leaves; the rapid expansion of the foliage covers these before the mines become visible from the top of the leaf. The next generation will be more visible as the female prefers to lay eggs on the young expanding leaves of the growing shoots. By the time this second generation has reached the late tissue feeding stage and the mines become visible from the top of the leaf, parasitism should be easy to find unless Lorsban or Vydate L was used prebloom. You can tolerate 4 - 6 mines per affected leaf at this stage of the second generation if you can find either parasite larva and pupa or dead leafminer in 25% or more of the mines and will not be using a material that will destroy the parasite population later in the season.

If you are one of the unfortunate growers that had to control for leafminer prebloom because of the sheer number of adults, monitor the second generation closely. Populations will quickly rebuild from adjoining orchards that may not have been sprayed, plus it is unlikely there will be any predator control available in the block that you sprayed. In this situation the new mines will probably become readily visible about second Codling Moth cover time.

Leaf miner is easily controlled if you pay attention to the life stages. Application of **1% oil** to the adults destroys the wings and prevents egg laying. If this is applied at peak adult emergence between the first and second generations and you have some predator population in the orchard your leafminer problem is probably over for the year.

Monitor the leafminer from the back of the leaf. The eggs are very small, nearly transparent or lime green. As they hatch the larva will begin to tunnel in the leaf making a thin white line beginning at the edge of the egg, rapidly expanding into an easily visible white spot. The mine will not be visible from the top of the leaf until the tissue feeding stage and the leaf begins to pucker up.

To find *Pnigalio* larva you must open up the mine. A pair of simple drugstore tweezers works well for this. Carefully grip the back cover of the mine and strip it away. The larva is white to cream colored and spindle shaped. It feeds on the exterior of the leafminer larva and is easy to see with a hand lens. The *Pnigalio* pupa begins as a very light gray and darkens to a shiny black. It is ½ to 2/3 of the size of the leafminer larva. If you open flat mines and find discolored or very lethargic leafminer larva that is a pretty good indication that the Pnigalio wasp is active in the orchard.

Finally there is the old standard control. Wait until the earliest hatching larva of the new generation begin to enter the tissue feeding stage (just visible from the top of the leaf) then apply **1 quart of Vydate L** per acre. This is strong enough to kill all stages of the leafminer except the tissue feeders but will also destroy the *Pnigalio* wasp, which will be mostly emerged by this time. This could also increase problem with integrated mite control by reducing the population of predatory mites.

Post bloom thinning

By the time this is mailed blossom thinning will be over, the earlier areas will already have at least on post bloom thinning application. The most common mistake made while chemical thinning is not being aggressive enough. Don't pull back, push to the limit of your comfort zone, a little past your comfort zone might save you quite a bit of hand thinning cost. The most frequent mistake made in post bloom thinning is to quit <u>one application too soon</u>.

If you are not experienced or comfortable with post bloom chemical thinning you have my sympathy, you are in for a gut wrenching time. Find a neighbor or fieldman who has experience in your area and use at least the maximum rate common for your varieties.

Fruit is easier to thin when:

Fruit spur are low in vigor, typically lower shaded inside branches
Bloom is heavy, especially following previous heavy crops
The variety is poorly pollinated or self-pollinated
The trees are young and have many vigorous upright branches
Blossoms and leaves are frost injured before or soon after spray application
Bloom period is short with many flowers open

Fruit is difficult to thin when:

Spurs are well exposed to the light (tops and outside).
Bloom and fruit set is light (except on young trees).
Insects are actively cross-pollinating.
Fruiting branches are mostly horizontal.
Biennial bearing trees are in the "off" year.
Older trees in good vigor have a mature bearing habit.
Bloom is extended over a long period and fruit is of various sizes.
Weather ideal for good growth occurs before and after the time for thinning.
There is no stress on the tree from weather, moisture, etc.

Here is a brief explanation of the post bloom materials available.

Sevin. (Carbaryl) All of the liquid or flowable carbaryls that I am familiar with have petal fall thinning labels. No differences have been reported between brands for either petal fall or fruit thinning. Petal fall applications are best timed to 4 to 6 days following full bloom, sooner in warm weather, as fruit growth is faster. Avoid applications during periods of cool and wet weather when trying to thin 10 mm fruit; thinning results will not be good. Incomplete fruit abortion may leave a large number of small seedless fruit on the tree at harvest time. Sevin XLR has marked some fruit when it was used in cold locations under poor drying conditions, sometimes with a silicone spreader. Used under good drying conditions and with a standard non-ionic surfactant there should not be any problems.

Amid-Thin at 3 - 5 mm fruit (petal fall, 4 – 6 days after full bloom) is useful for removing the late bloom on Golden, Gala, and Fuji and is usually combined with **carbaryl** and sometimes **Ethephon** (Ethrel). Do not use Amid-Thin on Red Delicious. I would not use it on any other distinctly typey apple such as Criterion or Primegold as it may affect the shape of the fruit.

Ethephon (Ethrel) is commonly used to thin and increase the return bloom on Golden, Fuji and sometimes Gala. When return bloom is a concern on these varieties, use it at the 1-pint per 100-gallon rate on Golden and Fuji. If you have difficulty getting good size on Gala, postpone the use of Ethephon until fruit cell division is over, about 6 weeks post bloom. If thinning conditions turn out to be questionable and you are concerned about return bloom you can use Ethephon at the mid summer timing on any variety to increase return bloom without additional thinning. I don't recommend using Ethephon if your bloom was light to moderate, you will cause even heavier bloom next year and aggravate alternate bearing.

K-Salt 200 (NAA) is commonly mixed with carbaryl on Goldens and Spur Reds at 10 mm and larger fruit to enhance thinning. I considered NAA to be the material most responsible for removing complete clusters. Under normal cropping conditions this is needed. With lightly cropping trees this may not be desirable, consider a lighter rate of NAA with carbaryl or even skipping the NAA and using maximum rates of carbaryl. Unexpected high temperatures following soon after a full rate NAA application have been known to overthin, more commonly at the 15 mm and larger fruit stage than at the petal fall stage. Look at the weather forecast before you make that last application.

I recommend that you read or reread the chemical thinning section of the **WSU Spray guide**. There should be some copies still available at your NWW warehouse. I there are none, call me and I will have that section of the guide copied for you.

APRICOT

Mealybug

Usually the first indication that you have a Grape Mealybug problem in your apricot block is a white cottony deposit either in the stem end of the fruit or where two fruits have grown together, visible in the bin at harvest time. The overwintering

stage is safely enclosed in a cottony egg sack under the older bark scales or tucked into pruning wounds. By green fruit time all of the nymphs will have moved out onto the twigs and foliage to feed.

If you suspect you have Mealybug, scrape away some of the bark scales in a spray-sheltered part of several trees to finds the white nesting material. When you find nesting material check the twigs, leaves and especially the stem end of the fruit for the nymphs. Apricots rarely support aphids, if you find areas of honeydew spots glistening on the leaves this early in the season that may be an indication that you may have Mealybug. Check the leaves, twigs and fruit in and above the honeydew area. I have seen situations in vigorous, well irrigated apricot blocks where the gland at the base of the leaf was dripping nectar down through the tree, giving the appearance that there was either Grape Mealybug or Aphid feeding in the tree, you have to find the insect to be certain of the honeydew source.

Control is a full dilute spray of **Diazinon 50WP** @ 4 lbs./acre or **Imidan 70 WSP** @ 4 lbs./acre or **Provado** @ 8 oz./acre. Use enough water to thoroughly wet the woody structure of the tree. Make an entry in your diary that you should start control next year at petal fall. New this year is **Centaur @** 34.5 oz. Per acre. Be sure to ask for the supplemental label for stone fruits at the counter. Centaur has shown excellent control of Mealybug.

Perfection Spot

Perfection Spot is aggravated by rain, your past history has a strong bearing on how much protection you may need. **Rally 40WP** @ 5 ounces or **Orbit** @ 4 oz. per acre works well, combine either one with **Captan 50WP** @ 5 lbs. per acre if the weather is expected to remain wet, especially if Coryneum Blight is a concern. Apply your first protection at shuck fall, a second about 14 days later. Further applications will be required at rainy periods if you have a history of fruit marking from Perfection Spot. Spraying before shuck fall will not thoroughly protect the fruit.

Peach Twig Borer (PTB)

I have a few reports of apricot growers finding PTB infestations after shuck fall. When I ask about their early season control I'm told they did not apply a prebloom material, only a single control at late petal fall or early shuck fall. When the prebloom application is missed, the earliest emerging PTB will mature enough to take up permanent residence inside of a growing shoot and be protected from a shuck fall application. If this happened to you make a note to not forget that prebloom application next year. Peach and nectarine growers who did not apply Asana at the redbud stage for aphid but waited to use Provado post bloom will have the same problem if PTB over wintered in the orchard.

The first PTB catch in the Wenatchee area is normally about mid-May at Rock Island. If you plan to monitor for activity and use the model to time your sprays have your traps in place by early May. Monitor them twice per week. Report your first catch to your local Northwest Wholesale warehouse or me. We will update you weekly on the progress of the current generation. The alternative is to apply **Imidan 70 WSP** @ 4 lbs./acre 14 days before you expect to pick the fruit. Intrepid may also be used, the PHI is 7 days.

Thinning

In order to grow the large sized apricots that command a premium price you must thin early and ruthlessly. Minimum spacing is 6 inches, 8 inches is better. More than 8 inches will probably reduce your total yield without appreciable gain in fruit size. The sooner you can get the crop load reduced the larger the remaining fruit will get. Begin thinning as soon as the larger apricots are easily distinguished. The smaller fruit does not have to be removed, the seed is dead and it will drop in a couple of weeks.

CHERRY

Shothole Borer

Shothole Borer Nursery

Shothole Borer Incubator

Shothole Damaged Cherry Tree

I'm told a single picture is worth a thousand words; here are three pictures I think you should pay attention to. I took these pictures near the end of August last year where cherry prunings had been saved for firewood. The first picture could just as well be any pile of prunings that were hauled from the orchard and not burned early in the year. These prunings are very attractive to the first generation of Shothole borers as they slowly dry in April and May. They will support at least one generation of Shothole borer, maybe two before they become completely dry. Any unburned brush pile could be a major source of the insects that will come into your orchard after cherry harvest looking for someplace to feed and lay eggs.

The center close-up shows where the mature beetles have emerged from the 2" to 6" diameter wood in mid summer. If you have any doubts about whether there are Shothole borers in your area, check your pruning pile about July.

The right hand close-up is a young cherry tree about three rows into the orchard, representing in my opinion about three wasted years, it's going to die. Need I say more? To prevent this from happening to you, burn or shred all stone fruit prunings in the spring. I think the risk to your orchard is greater than the value of the wood for your fireplace.

Mildew Program

Mildew is the major concern for cherry growers during the month of May and into mid June depending on where you live. Cherry mildew infection periods have occurred in all districts before this was written. From this point on you are depending on eradicating existing mildew (whether you can see the colony or not) and protecting new foliage. Your goal is to delay the inevitable mildew epidemic, complete with infected fruit until after harvest.

Elite, Procure and **Rally** have become the SI materials of choice and should be rotated to minimize further development of resistance to that class of materials. Don't depend on them to carry you for the entire growing season.. Orbit is no longer performing well for mildew control but could still be used effectively as a blossom period Brown Rot control.

Abound (a strobilurin) is only usable in limited circumstances. The material is highly phytotoxic to some varieties of apples. They may be damaged from drift during spraying or from the residual chemical in the sprayer if the same machine is used in both apples and cherries. A quick flush of the sprayer is not enough to prevent damage. If you think you might be able to use it, contact your fieldman for detailed information.

Cabrio and **Pristine** are additional strobilurin materials without the phytotoxcity concerns of **Abound**. Dr. Grove recommends using either of these two materials back to back for two sprays, then rotating into a different chemistry. Check

with your packinghouse fieldman for export tolerances on these two materials. Very recent information out of New York indicates cherry mildew may develop resistance to the strobilurin materials relatively rapidly. Resistance developed in New York after 15 applications, not gradually but with total failure after 14 or 15 applications. Do not use any more than two applications per season; it is preferable that they be applied back to back.

Quinolines; Quintec was very highly rated by Dr. Grove. Use it in a rotation with other materials at GA timing or later. Do not make more than two sequential applications.

It is very important to use all existing materials as effectively as possible. Following the method described above will have you treating the most vulnerable stage of the mildew (before you can see it). Tank mix with **Kumulus Sulfur or Sulforix** or a **carbonate** for resistance management unless you are using **summer spray oils** for mildew control. The **carbonates** are most effective when combined with the protectant/post infective kickback activity of an SI or strobilurin material later in the mildew season. Oil is an excellent eradicant and resistance management tool. (see OIL, below)

The first mildew control should be applied no later than shuck fall. Most of you are irrigating by this time and have applied more than enough moisture to release spores. A 55-degree night with a couple more hours to dry the bottom of the tree off the next morning will easily qualify as an infection period! Apply the second mildew cover no more than 2 weeks later to protect the rapidly increasing volume of new foliage. None of the materials are systemic. If the foliage has not been directly sprayed it is open season for any new mildew spores that land on it. Thorough coverage is essential. You must drive slowly enough for the fan on your sprayer to completely displace **all** of the air within the tree, not just push some mist through the open areas of the tree row into the next middle where you see it and assume that your coverage is thorough!

Dr. Gary Von Eee, Michigan State University maintains we would have better coverage in the tops of the tree with smaller, instead of larger droplet size. If you've been having persistent trouble with mildew developing in the top and center of the tree, try calibrating your sprayer with the smallest core possible to allow the gallonage you want and let's see what it does. If you want help with the calculations contact me.

Continue to protect yourself at infection periods well into June. Once mildew is established on the foliage and fairly easy to find, 10 to 12 day intervals must be maintained into harvest, especially on the Rainier variety.

OIL has been used long enough to prove that it is an excellent mildew eradicant. There is a slight risk of fruit marking if oil is used after the fruit begins to change from dark to light green. To avoid this, Northwest Wholesale Inc is recommending two applications at 1 gal. /100 gals. (1%), beginning at shuck fall and nighttime temperatures above 40 degrees. Make a second application 14 days later. The second application may be made with ½% with good coverage if mildew is not easily found. Mildew control in the pre harvest and harvest period will require the use of some other materials to avoid the possibility of marking ripening fruit.

Thorough coverage of all of the foliage is critical, fully developed orchards will require 150 to 200 gallons for good contact. Do not use wettable sulfur within 14 days of an oil application; do not use micronized sulfur within 10 days of an oil application. For practical purposes this means that no sulfur would be used in the orchard until 14 days after the final oil application. The value of sulfur during the prebloom and bloom before you would use oil is minimal. The temperatures are generally too cool for either mildew germination or sulfur vaporization.

Do not use Guthion (AzinphosMethyl) or any other organophosphate for cherry fruit fly control if you have used oil for mildew control earlier in the season. Under some circumstances severe leaf and fruit damage may occur.

Cherry mildew control with micronized sulfur alone requires a set schedule of frequent applications. You must maintain a protective barrier or film of sulfur on the rapidly expanding leaf surface. The growers that succeed with sulfur use a seven to ten day schedule, beginning at petal fall. If it rains between scheduled sprays they reapply.

A sulfur program I am told is used successfully is one pound of sulfur per acre per day. The initial application is 10 pounds per acre, usually at shuck fall. Each subsequent application is an additional pound per day for each acre. Using this formula, if you were spraying every week you would apply 7 pounds per acre each week, at a 10-day interval you would apply 10 pounds. Fourteen-day schedules are seldom successful. If rainy weather forced you to reapply at 4 days you would only apply 4 pounds per acre. The objective is to maintain frequent coverage without building up excessive sulfur on the leaves.

Dr. Grove's preferred cherry mildew program is two oil sprays first, followed by two strobilurin sprays, then use the SI materials tank mixed with a carbonate such as Kaligreen for additional immediate knockdown during the preharvest period. His goal is to prevent the mildew from becoming established for as long as possible. He has no doubt mildew will become established eventually and fully involve the tree, he wants to have the fruit harvested first.

Insect protection

Shuck fall is the preferred timing for a general cover with the young fruit now exposed to mildew spores and insect feeding. As the vegetation on the hillsides begins to mature the Green Soldier Bug will move into the orchards in some locations. This particular insect is very shy and hard to find, as it is nearly the same color as the leaves and fruit. The damage does not show up until the fruit begins to turn color. **Thiodan 50WP** is the only material that we know will control this insect; you will also get some suppression of Lygus and Leafhopper. Use Thiodan 50WP at 4 to 5 lbs. per acre.

Spraying just before shuck fall will reduce fruit residue. Some export markets do not have a tolerance for Thiodan. Check with your packing warehouse if you are in doubt. The maximum amount of Thiodan that can be used per year on any crop is 6 lbs. per acre; a 300-foot buffer from the nearest body of water must be maintained.

Foliar Nutrients

Most of the cell division in cherries occurs before pit hardening. To have the maximum influence with foliar applications they should be made at prebloom, petal fall, shuck fall and about 10 days later if the crop is heavy. Mildew and insect materials may be combined as needed.

Be cautious tank mixing soluble fertilizers (20-20-20, 9-15-32, etc:) with oil, stay below 3 lbs./100 gallons. Use of Tech-Flo Beta, (or Tech-Flo ZMC) Tech-Flo Cal-Bor+Moly, and Tech-Flo Sigma @ 2 quarts each per acre combined with 15 lbs. of fluid grade Calcium Nitrate is OK, these are wettable powders in suspension. Nutra Phos K (Zn-K) @ 12 lbs./acre plus Sorba Spray MG @ 1 pint/acre plus solution grade Calcium Nitrate @ 15 lbs./acre is an alternate program.

I suggest you add 5# per acre of Miracal to your foliar nutrient sprays to increase fruit firmness. Delivering a firmer cherry with more shelf life will pay dividends.

Cherry Fruit Fly

Emergence of the first fly typically happens about the same time as GA is applied when the fruit becomes light green to straw colored. The potential numbers of Cherry Fruit Fly increase as the fruit ripens, peaking during or shortly after Bing harvest. Most markets have a zero tolerance for fruit fly infested fruit so a rigorous prevention program is required

Diazinon AG500 should **NOT** be used on any light colored cherries to avoid fruit marking. Many warehouses do not want any use of Diazinon on cherries because of export marketing requirements. For local marketing or home use, Diazinon AG500 will make material rotation easier. The preharvest interval (PHI) is 21 days.

Micro Flo (Arysta) Dimethoate 4E labeling allows for a single use preharvest plus a single use post harvest. The preharvest interval is 21 days. If this material were used first in the rotation it would reduce the need to apply multiple carbaryls. Check with your packinghouse for marketing restrictions before using it.

Guthion 50WP or **AzinphosMethyl** must have a 14-day interval between sprays. **Do not use AzinphosMethyl or Guthion for cherry fruit fly control if you have used oil for mildew control earlier in the season. Under some circumstances severe leaf and fruit damage may occur.**

Carbaryl or Sevin has a 3-day PHI. Multiple use of carbaryl will increase your risk of post harvest mite infestation, don't use it more than once unless absolutely necessary.

Success (spinosad) at 4 ounces per acre in 200 gallons will control fruit fly and provide some suppression of leaf roller. If you need Leaf roller control you will have to use it at 6 to 8 ounces per acre. PHI is 7 days. **Entrust** is the organic certified version of Success, promised to be available by mid May. The same preharvest intervals apply.

Pyganic is a liquid Pyrethrin that is also certified for organic use. This will take the place of Pyrellin, which has not been certified organic. Pyganic did not prevent cherry fruit fly damage last year when used diluted. If you need to use this material, calibrate your sprayer for very low gallonage (25 – 35 gpa) at very low speed (1 – 1 ¼ mph) for maximum fly knockdown, there is no residual effect. Call me if you need help with sprayer calibration.

GF-120 Naturalyte (spinosad) performed very well in organic orchards with known fruit fly populations in past years. The application method is different; it is bait not a spray. The fly is attracted to the bait and killed before it matures and begins laying eggs. The first

application should be made while the previously applied material is still protecting the orchard. If you wait until the previous protection has run out you run the risk that a mature fly may lay some eggs before being killed. The PHI is 0; this will be an excellent material to use during harvest. It may be applied easily with a tank on the back of your 4-wheeler after the pickers have left for the day. I believe at least some of the helicopter services will be equipped to apply this material; they may no longer apply Malathion within 300 feet of salmon bearing water. For more detailed application info or a parts list if you want to build your own assembly contact your fieldman.

Control of Cherry Fruit Fly is based on the life cycle. It requires approximately 7 days to emerge, mature and begin to lay eggs. The ideal control schedule is to apply a material every seven days after the first fly emerges. The goal is to not allow any of the flies enough time to mature and begin laying eggs. When infected fruit has been discovered at the packinghouse it has usually also been determined that the coverage interval has been extended to 10 to 12 days because of poor weather or harvest work. Or one or more of your trees were growing up against a building or ditch bank and could not be thoroughly covered. Keep your coverage on time and complete until all of the fruit is harvested. Then apply a clean up spray to insure that you start off the next year clean again. I'll remind you about that in the next issue.

Gibberillec Acid

Apply **ProGibb 4%** or **Gibgro 4%** @ 1/2 pint/100 gal. (20 PPM) when the fruit is light green to straw color to delay harvest, to produce a brighter colored, firmer fruit, and to increase size. Apply with enough water to thoroughly wet the entire tree. **Do not adjust the concentration of the solution in the tank to accommodate the amount of spray solution it takes to wet the trees.** It is better to apply this spray when the cherries are on the lighter green side than to wait until they are turning pink. Straw color is ideal. Slow drying appears to increase the response similar to Promalin in apples. Nufilm 17 will increase the spread of the material and slow the drying. Use ½ pint per 100 gallons. **The 4% liquid is also organic now!**

The 20-PPM rate is a standard rate for normal vigor Bing, Van and Lambert trees with a full crop. Some of the later ripening varieties such as Lapins and Sweetheart may be treated with 30 PPMs. In blocks where cherry set is reduced, reduce the rate of GA proportionately, e.g. one-half crop use 10 PPM (particularly Lamberts). Do not use higher rates on excessively vigorous trees. At higher rates, GA will tend to increase vegetative growth at the expense of fruit production the following year. **Many packing warehouses do not recommend more than 10 ppm on Rainier cherries to avoid unwanted skin coloration at the tip of the fruit.**

The timing for GA applications normally falls within the period that we are applying our first cherry fruit fly sprays. GA has been found compatible with all the materials commonly used for cherry fruit fly. Vapor Gard may be combined with your GA to save you a trip through the orchard. I have noticed increased response from GA treatments when they were combined with Vapor Gard.

Vapor Gard

I have worked with Vapor Gard on cherries for the past several years and personally would not grow a cherry crop without using it. The benefits that I have seen are as follows; increased fruit size (5% to 7%), less skin abrasion on Rainier, rain is blown out of the trees easier than untreated trees, rain cracking is reduced under slight to moderate conditions. When rain cracking is severe there is no material difference between treated and untreated. The fruit finish remains bright after application and does not dull in storage. In 1996, treated and untreated fruit picked, hydro-cooled, held in storage and independently evaluated weekly for 4 weeks was indistinguishable after the first week. The treated fruit was rated as the most attractive at weeks 2, 3, and 4. Replicated trials have not shown a statistical difference in sugar accumulation between Vapor Gard treated and untreated fruit.

There are some cautions that must be considered to use Vapor Gard successfully. The fruit must be clean when the material is applied. Mildew must be well controlled and the use of heavy residue sprays such as Kumulus Sulfur stopped at least 14 days before any Vapor Gard application. A dirty cherry **CANNOT** be cleaned up at the warehouse. Rubigan, Rally, Benlate and Sevin 4F have not caused residue problems in orchards using multiple Vapor Gard applications in the month prior to harvest. Nor has there been any apparent change in the ability to control mildew and cherry fruit fly with the normal materials. The growers using Vapor Gard have not observed any detrimental effect on the tree.

If you plan to use **Bird Shield** or **ReJeX-iT**, do not apply Vapor Gard on top if you can smell or taste the grape. Vapor Gard will prevent the odor and taste from normal weathering.

The most consistently beneficial Vapor Gard program I have observed is one gallon per acre tank mixed with the GA treatment, followed by another ¼ to 1/2 gallon with each cherry fruit fly or mildew control through harvest. There is no preharvest interval required. Complete and uniform coverage of the fruit and foliage is needed; don't use less than 200 gallons per acre.

Single application programs for increasing fruit size should be made at the GA timing. Applications to prevent minor rain splitting of the fruit should be made 7 to 10 prior to harvest or just before anticipated rain. The material cures with about 1 hour of bright daylight and is completely rainfast after that.

Vapor Gard will not set up anywhere inside the sprayer that is not exposed to bright daylight. The outside of the machine will be very difficult to clean however. Coating the sprayer with diesel or spray oil prior to using Vapor Gard may make it easier to clean up.

Birds

Bird Shield and ReJeX-iT are similar materials in that both employ the odor and taste of concord grapes to repel feeding. They are applied at different rates, so read the label on the material you plan to use.

Both materials must be applied at the first evidence of bird feeding. It is much easier to keep birds out of the orchard than to drive them out after their feeding habits are established. Resident (nesting) birds do not normally leave the orchard. Do not over apply. In young orchards that are very open, the adjacent rows that are being resprayed could suffer some leaf burn. Consider alternate row application under this situation. Wet the portion of the tree that you are targeting well, but do not over spray. (Saves money, too.)

The material smells and tastes like concord grapes. Birds don't like it. The flavor breaks down in bright light and must be completely undetectable before you harvest the fruit. Normally 7 to 10 sunny days are needed for this to happen. I believe you should apply it similar to a thinning spray on apples. Close off the bottom nozzles and put the majority of the material in the top and outside of the tree. That is where the initial bird feeding will begin and the high light levels there will breakdown the grape flavor quicker.

If you have nesting or roosting trees adjacent to your cherry orchard that birds are using for a staging area, spray those trees also. Use a handgun if you can to get the material as high in those trees as possible.

PEACH/NECTARINE

Green Peach Aphid

Green Peach Aphid should have been cleaned up by your dormant oil and Asana spray. If they were not you may apply **Provado** @ 2 oz./100 gallons as soon as possible after bloom. Be very alert for mite population increases later in the summer Including 1% oil with the Provado my suppress a potential mite build up and will add to your mildew control.

I have had some reports of Ecozin or Aza-Direct being effective on GPA when combined with oil. I've also heard some reports where it didn't work. I suspect control is very dependent of warm weather and good coverage. Aza-Direct is organic, Ecozin is not.

Mildew/Coryneum Blight

Nectarines and the mildew prone varieties of peaches need mildew control beginning at petal fall, **Rally 40WP** @ 5 ounces or **Orbit** @ 4 oz. per acre tank mixed with 10 lbs. of **Kumulus sulfur**. Coryneum Blight will not be a problem if you have been applying a fall copper spray regularly unless the spring has had several wet rainy periods. The first visible indications of Coryneum Blight on the fruit will be a watery looking spot, sometimes with a tendril of ooze curling out of it as the disease progresses. **Ziram 50WP** is a good protectant, use 5 lbs. per acre applied before the disease is established. Use two **Captan 50WP** applications @ 5 lbs. per acre 10 - 14 days apart if you can see the disease developing on the fruit.

I have had good response controlling mildew on peaches and nectarines with oil, treating them as I have been cherries with a 1-% solution, except that I start at peach petal fall. The second application is 14 days later, corresponding to cherry shuck fall. A third application is made 14 days after that. I have not marked either peach or nectarine with this program. The key is to start early, at petal fall. Foliage mildew may develop on the terminal growth in late July, I normally don't treat this on Red Gold nectarines or Hale peaches unless it becomes very heavy because it poses very little risk to the fruit. Treatment may be necessary on late maturing varieties that are prone to mildew.

Peach Twig Borer (PTB)

See the Apricot article for information on monitoring Peach Twig Borer. The control timing for the first generation on Peach and Nectarine if you don't use the PTB model is 7 to 10 days later than on Apricots because there is no need to be concerned about a pre harvest interval on Peaches and Nectarines in late June.

PEARS

Petal fall

Petal fall timing is important for Grape Mealy Bug, Leafroller and Alfalfa Greening control. **Actara** or **Assail** for Grape Mealybug and Pear Psylla, **Assail** will provide some codling moth control. **Esteem** may be used for Psylla, leafroller, scale and early codling moth control. **Intrepid** may be used for leafroller and early codling moth control also. Add nutrients, **Alpha DF or Nutra Phos 24** @ 12 lbs./acre or **Miracal** @ 5 lbs. /acre for the calcium source. **Dithane** @ 8 lbs./acre for fruit finish and some Psylla nymph control may be included now. This is as late as you can use this high rate of Dithane.

Without mealybug to worry about you may consider early petal fall **Agrimek** or a half rate **Agrimek** with full rate **Ecozin** combination followed by another half rate **Agrimek** in about two weeks to finish off the first generation of Psylla and prolonged spider mite control.

What you need to do for Psylla control will be determined to a large extent by how well your pre bloom applications did. If you now have a light population, consider using **Ecozin**, **Neemix or Aza-Direct** (azadirachtin) with oil for a low cost treatment to carry you to the **Assail** timing for codling moth. If you plan a full azadirachtin and oil program, it should begin at petal fall. The oil applications in this program will suppress any spider mite buildup. Azadirachtin works best when the weather is warm. Multiple applications have an additive affect on the Psylla population.

If neither azadirachtin nor Agrimek is used at petal fall, monitor the McDaniel mite populations in the center of the trees, you may be able to wait until first Codling Moth cover to apply a control material. Or you can depend on one or more summer oils for mite control.

The Ecozin or Neemix program must be continued for the duration of the first generation at 10 to 14 day intervals, slightly longer intervals are possible if you are spraying at 200 gpa or more. Expect to find some Psylla and Mealybug in your orchard, but the population should not be thriving. The program must continue until hatching psylla are no longer found, probably into the second generation for a total of 5 or 6 sprays. In organic blocks we frequently have a rapid population decline after the third application of Ecozin or Neemix

Don't you just love all of these choices? See the comments on resistance management on page 13.

First Codling Moth Generation

Use the Codling Moth degree-day model to time the first spray. If you don't know what Biofix is for your area use the full bloom date for Red Delicious, it will be very close. A copy of the Codling Moth model is available at your nearest NWW warehouse. If you keep the first generation of Codling Moth under control you will have much less problems with the second generation later in the summer. Unless you are certain that your pressure is very low, or you are using Mating Disruption apply two covers to the first generation then hang moth traps in the block and monitor for second generation.

If you are using mating disruption and had **ANY** codling moth damage last season, you must have control of the first generation this year. A complete cover at peak of egg hatch is strongly recommended. Avoid the application of oil and Imidan, it may cause fruit marking on some varieties.

If you plan to use an Insect Growth Regulator material such as **Esteem, or Intrepid** your timing is different than for Guthion. **Esteem@** 5 oz./acre, **or Intrepid @** 16 oz./acre should be applied at 100 degree days post biofix (late petal fall) and again 14 to 21 days later. If you have not applied any material for Psylla post bloom, **Assail** @ 3.4 oz./acre at 200 – 250 degree days may be a good option at this time, see petal fall comments.

First codling moth cover is probably as late in the season as you can expect long-term control from **Agrimek**. As the leaves mature they lose their ability to absorb **Agrimek**. If you don't need Psylla control at first codling moth timing and want to wait and watch the population pressure, short-term control is possible later in the season with **Agrimek** or **Actara**. If you are not using Agrimek until later in the season, seriously consider the use of **Apollo** and **oil** at first cover to stop the mite build up. If you wait until there is a damaging mite population you will need to **Acramite or Zeal** for adequate control.

Guthion for Codling moth control @ 3 lbs. per acre, **Agrimek** for Psylla control @ 20 Oz. Plus 1 gallon of Omni Oil or another high quality surfactant at label rate. **Apollo** @ 4 oz. per acre plus 1% oil for mite control if you aren't using Agrimek. Begin your summer calcium program with **Miracal** @ 4 to 5 lbs. per acre or **Calcium Chloride** @ 4 lbs. per acre.

Guthion (Azinphos) has a 14-day REI. If you can't manage with that, use Imidan 70WSP (24 hr. REI) at the top label rate. Less material will not provide more that 12 to 14 days of control. **Assail @** 3.4 ounces per acre for codling moth control has a 12 hr REI and provides Psylla control.

Depending on the temperatures the first generation of Codling moth lasts for 6 - 8 weeks. A second cover will be needed 18 - 21 days after the timing described above. This is the time to be concerned about the summer generation of Mealybug also. The alternatives are **Guthion 50WP,** (limit of 6 lbs. per year**) Imidan 70WSP, Assail, Actara** (limit of 8 oz. per year) or **Provado** (limit of 40 oz. per year) at maximum rates. Guthion is the stronger Codling Moth material; Actara and Provado have no effect on Codling Moth. Be aware that high rates of Provado and Assail may increase two spotted mite populations. The addition of 1% oil will help to suppress a possible spider mite increase. Add a calcium material such as **MIRACALsp**. Avoid the application of oil and Imidan, it may cause fruit marking on some varieties.

Resistance management.

Chloronicotinyils (Provado, Actara, Assail, Calypso, etc) are becoming a major part of the pest control arsenal in pears for Psylla, Grape mealybug, Codling Moth and Aphid. If these materials are used all season long to control one insect after another it will be a very few years and they won't provide you with the control you need. Careful material management is going to be needed to avoid multiple generation exposure of Psylla and Mealybug to these materials. If you have used either Actara or Assail for prebloom and post bloom Psylla control, plan to use something else for summer Psylla and codling moth control.

Surround for Summer Psylla control

I don't recommend Surround for summer psylla control because it impossible to get and maintain the near perfect coverage required. Therefore we only recommend Surround for Psylla control pre bloom, switching to more conventional programs for the summer generations.

Fire Blight

Secondary bloom on Bartlett will begin 2 - 3 weeks after petal fall and continue for up to a month. Monitor the daily temperatures and compute your risk using the **CougarBlight** model. Managing your risk in this manner will save you time and money verses 'just in case' spraying. It will also preserve the use of the only currently effective material by slowing resistance development. Copies of the current CougarBlight Version are available at any NWW warehouse.

Russeting Bosc Pears

A program has evolved through usage that helps develop a deeper and more uniform russet on the older strains of Bosc pear. It requires a minimum of three applications with the first application is made shortly after petal fall while the small fruitlets are still standing upright, the second application after they have begun to turn down, with a third application after most of the fruit is hanging calyx down. I have heard reports of growers making 5 and 6 applications during this same time period for more uniform russeting.

The best reported results are from a well-calibrated 100 gallon per acre application that is uniform and avoids causing large droplets on the low point of the fruit that may scar the fruit more than desired. The tank mix most commonly used is **1 lb. each per 100 gallons of Calcium Chloride, Calcium Nitrate, Urea, and COCS or Nu-Cop 50DF.** If you have not done this or something similar before, test it on a small lot the first year to get some experience. Do not substitute zinc compounds for the copper compounds, the damage will be excessive. **Do not allow this mixture to drift onto any variety other than Bosc.**