NORTHWEST wholesale incorporated Grower's Guide

**GROWER FIELD GUIDE, September 2011**

The season has continued to stay a little behind. We haven't caught up with the late start to the 2011 season and many of you harvested cherries later then you ever have before. Cherries are still being picked as I write. I have to say that I think it is the latest I can remember for all of these crops. I have received many calls with concerns about fruit size this year. I guess that we will all have to wait and see what happens with harvest. I have been measuring fruit for the last few months and it actually looks pretty good in most areas. I think that the growing days with cooler temps have been good for us. The stress of higher temperatures hasn't shut trees down like normal and it could be surprising when we finally get around to picking. I will tune in later and find out!

You should be laying the foundation for next years fruit quality during the harvest operation, as hectic as that may sound. By watching the fruit in the bin you will spot the areas in the orchard where size and color are problems, look at the trees now and see how much shade has to be removed to correct the problem. Maybe those very vigorous trees in the corner of the block could do without nitrogen again this coming year?
Or maybe you've gone the other way trying to cut costs and have held off on the nitrogen one year too many? Maybe your trees aren't as green as they should be and the fruit size is down just a little?

What pests used your fruit for lunch and where were they located? On the orchard border (invasion), throughout the block (home grown), in the center and upper part of the tree (coverage)? Make notes, point it out to your fieldman for next year, it is amazing how easy this will be to forget next spring when you're at your busiest.

Be sure that you get a copy of the cull analysis from your packing house so you can put a number to the various problems that you want to correct, and then plan for the best time to ***prevent*** them during the next growing season. If you are not sure what you are seeing either in the orchard or in the cull bin, call your fieldman, that's part of his job. A relatively small cost at the proper time next season to prevent a problem will be much less expensive than regaining control of a problem later in the growing season.

Decay prevention at harvest time begins with sanitation. Be sure there are no mummified fruit (or gravel) in the bin prior to placing new fruit in it. Harvest bins should always be placed on grass, gravel or a paved surface to prevent contaminated dirt from the orchard floor from being dropped into a lower bin of fruit during the stacking and hauling operation. During the stacking and loading operation at the orchard, take the time to remove all of the sod, dirt and rocks that are being carried on the bin runners ***before*** you stack them up. Trying to clean up a bin of fruit by removing a wad of sod and dirt that has dropped into it is somewhat like trying to clean up after a broken feather pillow by hand; it can't be done in the time available. The boxes of fruit saved by decay prevention will pay for a few additional hours of labor at harvest.

I have freely and shamelessly 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 Grower Field Guide. Any errors in presenting that information are entirely mine; please notify me of any errors 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! All material rates in this bulletin are based on dilute applications at 400 gallons per acre unless otherwise noted.**

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.

I occasionally refer to articles in back issues. If you do not have the issue, check for it at the nearest NWW warehouse, they have it or can get it for you. All issues are posted on our website, http://www.nwwinc.com/fielddocs/index.html

Call me for address corrections or to be added to our mailing list. If you provide me with your e-mail address I will send you a copy about one week earlier than the post office can.

Nathan Squires, Field Services Manager.

Telephone, 509-662-2141, Toll free, 800-874-6607 E-mail, Nates@nwwinc.com

## APPLE

### Codling Moth

By late summer the codling moth situation becomes quite variable and must be treated on a site-by-site basis. Continue monitoring until at least mid September and check the WSU Tree Fruit Pest Advisory. We have had a third generation for quite a few years. With the late year that we have been experiencing it might not be that way this year. The Extension website is, http://www.ncw.wsu.edu/treefruit/. The model information is useful, but it is less accurate that it was during May, June and July. There are significant differences caused by geographical features, such as altitude, air drainage, slope aspect, and especially the number of codling moth that survived the control programs (or lack of control programs) in your neighborhood. These differences cause minor variation in the early season, but they are multiplied with each succeeding generation of codling moth. Remember that Decision Aid is probably the most accurate tool.

Activity should decline rapidly as the heat units and day length trail off past mid September.

Imidan 70 WSB has a 7-day pre harvest interval; Guthion 50 has a 14-day PHI @ 2 lbs./acre, 21 day if the last application is more than 2 lbs./acre; Assail has a 7 day PHI, Altacor has a 5-day PHI and Delegate has a 7-day PHI. Tourismo is 14 days PHI.

### Leaf Hopper

If the populations are high enough to be a nuisance to the pickers, leafhopper may be controlled with Sevin 4F @ 2 to 3 pints per acre. Carbaryl may be combined with stop drop sprays or a Ziram spray, but are not effective when applied by air.

Sevin has a 3-day pre harvest interval.

### Leaf Roller

It is far too late for any effective control, monitor for damage in the bin during harvest, this will tell you whether you need to change your approach for next year. Damage from the overwintering generation will be very fresh, very small, and very hard to see until some dehydration of the injury takes place. If you can easily locate damage that took place between two fruit or between a leaf and fruit, it probably happened in August as the second generation moved from hatching site within the tree to the terminal to feed and mature. Warehouse cull analysis will be an important part of your assessment for control next year.

### Lacanobia

The second generation will remain active through September. Growers that have experience with this pest generally control the first generation aggressively to avoid late season damage. Growers that are just being introduced to this pest may find numbers and damage that is surprising. It is important that you identify any late season fruit damage that appears to be caused by feeding larva. This will help determine when and what to do next year.

### Perennial Canker, Apple Scab

Older trees that have a lot of pruning scars or have had winter damage in the past can easily harbor Perennial Canker. Fruit from older trees should be protected if it is to be stored more than short term. Any orchard with an apple scab infection this year should also be protected. Control measures for either of these should have been applied by mid August before the fall rains begin. For fruit that will be harvested in late September a second application should be made in early September.

If you used overhead cooling you should assume that you will be at risk for Bull's Eye Rot or Pinpoint Scab and apply protection.

Use Ziram 76 DF @ 8 lbs. per acre.

Ziram is compatible with MIRACALsp or Calcium Chloride and K-Salt.

K-salt has a 2 day pre-harvest interval, and Ziram is 14 days.

### Sunburn

Fuji benefit from an additional application of sunburn protection materials in early September by preventing the fruit from taking on as much of the 'Buckskin' color that is common with Indian summer type weather. Repeat applications of either Surround or Vapor Gard are generally made at ½ rates. Raynox calls for all applications to be made at a full rate.

### Ethephon Sprays for Degreening Fuji

Over the past years, markets for Fuji have become quite particular for fruit color. Many growers have had difficulty getting a good background color break on Fuji, especially if nitrogen has been applied liberally to maintain tree growth.

Markets no longer accept green background color on Fuji. If they do, the price discount is substantial. One way to help reduce the greening and the number of pickings is to apply light rates of Ethephon prior to harvest. This program has been tried for the past few seasons with success. Fruit quality, fruit maturity, and fruit ripening were not changed by this application.

When using Ethephon always maintain an acidic condition in the spray tank. One quart of Tech Spray MG put in the tank prior to adding the Ethrel/Ethephon will be enough unless you have very highly buffered alkaline water. The Ethephon is also quite acidic and will increase the acid level of the spray mixture. Use 13 ounces of Ethephon to 400 gallons of water. This is the proper parts per million (60-ppm) concentration. Spray the trees to wet, not to drip. Depending on tree size and shape, the gallons per acre required will vary. Most high-density orchards will be well wetted with 80 to 100 gallons per acre. The first application is made approximately six weeks before harvest. Apply two more at seven-day intervals for a total of three sprays.

Make the applications at temperatures above 60 degrees, or when the temperature is expected to rise to 60 degrees or more within a few hours.

If you or your fieldman haven't used this program before, try it first on limited acreage until you have some experience with it under your growing practices and location.

## PEARS

Any post-harvest Rust Mite or Psylla control that is planned needs to be done immediately after harvest. The Rust Mites are moving under the bud scales at this time of year to overwinter and will be somewhat protected until they re-emerge next spring. Fall control of Psylla will be of little value unless the block is isolated or most of the growers in an area treat post harvest. Psylla adults disperse during the winter and recongregate in the pear orchards next spring, if you are not in an isolated location you will be sharing insects with your neighbor. The most common materials used are Lime-Sulfur (5+ gallons) and Oil, (1 gallon) per acre. **Do not** mix with the fall nutrient spray; allow seven to ten days between these applications.

Fall nutrient applications may start late in September. The application timing is determined by the weather. The daily temperature needs to be cool enough to avoid premature defoliation from the Zinc Sulfate in the nutrient combination, cooler areas can usually start in late September with the lower and warmer areas spraying in mid October. The leaves should remain green and active for about two weeks after the application to adsorb the nutrients effectively. (*See chemical defoliation*) Zeta zinc at 2 Quarts per acre is another option for the zinc with no defoliation and the temps not being as critical as zinc sulfate.

Zinc and Boron are elements in high demand by the tree early in the spring. They should be stored in the tree tissue from the preceding season as much as possible; they can't be picked up readily from cold soil. Use this timing to get some Zinc into the tree; don't plan on correcting a major deficiency with a single application. The leaves will burn and drop before much if any of the Zinc can be adsorbed if you use high rates. You can come back with multiple applications early next year, use only the maintenance rate now. Boron is readily adsorbed; the roots will also easily pick up any lost to the ground. Nitrogen aids in the adsorption of the other elements.

Zinc Sulfate @ 6 - 12 lbs., B-17 (Boric Acid) @ 3 lbs. Calcium Nitrate (spray grade) @ 20 -25 lbs. (or Urea @ 6 - 10 lbs.) per acre. Add Nu-Cop 3L @ 1/2 gal. per acre or Nu-Cop DF @ 4 lbs. per acre if copper levels are low.

### Post Harvest Sanitation

Missed Fireblight canker are easier to spot early in the fall, they cause the leaves on the affected limb to turn red or bronze two to three weeks earlier than the remainder of the tree. One or two quick patrols of the orchard in late September or early October will give you a chance to remove a lot of the disease potential for next spring by cutting out any cankers that you can find. The cleaner your orchard is during the high-risk period next spring the better off you will be.

## STONE FRUIT

### Coryneum Blight

Spread and germination of this disease begins with the first cool, wet weather of early fall. ***Apricots, peaches and nectarines should be covered in early September while the weather is still normally warm and dry. You're too late for optimum disease control if you wait until most of the leaves are off the tree and we've had a cool rain.*** The objective is to have a fungicide

barrier on the twig ***before*** the spore arrives, carried by the early fall rains. Good coverage of the structure of the tree is important.

Use Nu-Cop 3L @ 1/2 to 1 gallon per acre, or Nu-Cop DF @ 8 - 12 lbs. plus Nufilm 17 @ 1 pt. per acre. Lower rates should be adequate for maintenance in clean orchards, if you had fruit or leaf symptoms this year, use the higher rate. You get more copper for less money if you use the dry formulation.

### Post Harvest Mildew Control

Post harvest mildew control in cherries is based on reducing the number of cleistothecia that develop and survive to produce mildew spores the following spring. Growers that applied oil immediately after harvest and got good coverage have basically stopped mildew development in its tracks; consequently there should have been very little cleistothecia formation. Under these conditions I personally do not think a fall Lime Sulfur is cost effective.

A "Cadillac" program would be to apply two 1-% oil sprays about two weeks apart beginning no more than ten days to two weeks after harvest, earlier is better. The final part is an application of Lime-Sulfur at 10 gallons per acre just prior to leaf fall. Spore counts from a single trial done by Dr. Gary Grove indicate that a fall Lime-Sulfur is as effective as a combination fall and spring Sulforix in reducing the disease pressure. If you did not apply a post harvest mildew control, a spore reduction of 80% or more could be expected from a well-timed fall Lime-Sulfur application.

Do not combine Lime-Sulfur with the fall nutrient spray described below; allow 7 to 10 days between applications. I would apply the nutrient first to allow for maximum absorption time. If the leaves fall soon after the Lime-Sulfur it does not matter.

### Fall Cherry Tonic

Herb used that title because we frequently try to combine more than one objective into a final pass through the orchard with the sprayer.

Coryneum Blight, possible in cherries, has not been a major concern in my experience. Bacterial Gummosis is the more serious concern and can cause heavy crop and tree loss if ignored. Combining a copper compound with fall nutrients in late September to early October rather than waiting until leaf drop when the weather is colder and water supplies are uncertain has been very successful in established orchards.

The application timing is determined by the weather. The daily temperature needs to be cool enough to avoid premature defoliation from the Zinc Sulfate in the nutrient combination. Higher elevations can usually start in late September with the lower and warmer areas spraying in mid October. The leaves should remain green and active for about two weeks after the application to adsorb the nutrients effectively. (See chemical defoliation)

Nu-Cop 3L @ 1/2 to 1 gallon **or** Nu-Cop DF @ 8 - 12 lbs. plus Nufilm 17 @ 1 pt. per acre.

Calcium Nitrate (spray grade) @ 15 to 25 lbs. **or** Urea @ 8 to 10 lbs. per acre.

B-17 (Boric Acid) or Solubor @ 3 lbs. per acre

Zinc Sulfate @ a maintenance rate of 6 to 10 lbs. per acre.

Use enough gallons per acre to insure that the tree structure is thoroughly covered by the copper, don't run any more of the nutrients onto the ground than necessary. You get more copper for less money if you use the dry formulation.

## GENERAL

### Pre Dormant Fertilization

The efficiency of late summer or early fall fertilization holds as long as the weather is warm enough to keep the trees actively transpiring. Shorter days and cooler daytime temperatures will increase the time that is required to capture from the soil solution the nitrogen you apply, I would expect mid September to be nearly as good as late August except in cool areas. October is probably not much different than a dormant application.

See the August edition for the rates and rational for early fall fertilization.

**Post harvest management**

Your fall orchard management determines to a large degree your ability to control rodents, weeds and cutworms into the next season. Fall orchard sanitation to reduce rodent populations and other overwintering pests is critical for organic growers or growers planning to become organic.

Close mowing after harvest hastens the decay of dropped fruit, removing a food source for mouse build up. Don't forget the fruit that has dropped into the tree row, your mechanical brush rake will bring most of it out to where the mower can break it up.

When you've completed this, more of your broadcast mouse bait will penetrate the short ground cover into the runway where the mice can readily feed on it. There is also a lot less protection for the mice from predators. Removal or thinning of the mature weed cover and leaf mat in the tree row by raking will give you better herbicide performance. Without broad leaf weeds to develop on, cutworms will be less of a problem next year. It's worth the time and cost.

**Chemical defoliation, a good idea?**

No not in my opinion. The tree adds to winter hardiness with the carbohydrates and other nutrients that are reclaimed from the leaves as they senesce. You have been managing the nutrient level in your trees all summer to maximize the bud strength and reserves for early season fruit growth next year, don't blow it now by dropping the leaves before the tree can assimilate as much nutrient reserve as possible.

Zinc Sulfate applied at high rates or followed by hot temperatures will accelerate leaf drop by two to three weeks depending on the rate and temperature. To avoid this, wait until daytime temperatures are generally below 80 degrees, then use only the maintenance rate of Zinc Sulfate.

**Phytophthora (Collar Rot)**

Reddish bronze to purple leaf color early in the fall is frequently the first symptom of collar rot that you will notice in your orchard. Early leaf coloration of a single limb on older trees is not an indication of collar rot but is more likely to be winter damage or a canker in the above ground part of the tree.

The disease can occur on stone fruit but is most common on apple trees. Young trees (6 years or less) that uniformly turn bronze early in the fall usually have a problem in the root or crown area of the tree, either from rodent damage or collar rot. A little shovel work will quickly tell you which. Extension bulletin 1497 is available at any NWW warehouse for a description of the disease. Apple trees on MM106, M7a, M26, M9 can all be affected, especially on heavy soils that are kept wet early in the spring or in the fall after the need for heavy irrigation has past.

Ridomil Gold for ground application is best for a fall treatment; Aliette WDG is available for foliar treatments as soon as the trees have some leaf surface next spring. The rate of Ridomil is dependent on formulation, size of the tree and the method of treatment that will be used. Read the label for available options.

**Weed control**

Weed control in the tree row is much more than cosmetic. There is a measurable benefit to tree growth from the reduced competition for water and nutrients. Mouse populations are lower when there is little or no weed cover for them in the tree row. Cutworm populations apparently need broadleaf weeds for larval development, i.e., no weeds, little or no cutworms to worry about.

The most economical time to control weeds, regardless of the material that you choose, is in the fall before the leaves drop or with the leaves raked away, up until the ground is frozen. This application will control the fall germinating annuals that otherwise will require treatment in the spring shortly after petal fall when you have a jillion other things demanding attention. It is always easier and cheaper to prevent a problem than to cure it. (I personally have to relearn that lesson from time to time!)

The constant factors in safe and effective weed control are calibration, uniform coverage and timely incorporation of residual materials into the soil by irrigation or rain. Many of the residual materials used will injure trees if the application rate is higher than the immobilizing ability of the soil and they are carried deep enough into the soil to contact tree roots. In other words, light soils are more risky than heavy soils. *Application with a hand wand is dangerous because calibration cannot be controlled, and not all labels allow for hand application.* Check to be sure your nozzle style and configuration delivers a uniform pattern on the soil surface. Account for the overlap that you will have in the center of the tree row. Don't double the actual rate of applied material in this area by hanging extra nozzles or increasing nozzle size on the end of the boom.

Remove large weeds that prevent uniform spray coverage of the soil surface, the 'shadow' from existing weeds will be where your weed control will fail first next year. Do not spray over the top of a heavy leaf drop, many small germinating annuals will

be protected from the contact materials in the mix. If a windstorm moves the leaves before the next good rain, your residual material may be gone also. If you have a heavy weed cover in the row clean it up or mow it down before you apply the herbicide. The cleaner the soil surface at the time of application, the more effective the material will be. Organic matter on the soil surface will bind up some of the material before it can get into the soil. If you still have irrigation water available, incorporate the material soon after application with an irrigation of 2 – 3 hours, this will insure no weather degradation and allow the residual control material to bind close to the soil surface where it is most effective. A long irrigation set will drive the material deeper into the soil resulting in a weaker weed barrier and possible damage of young trees.

There are too many variables in crop, soil, tree size and weed population for me to dare to make a recommendation via this guide. I will attempt to list the more common materials and describe how, when and where they fit best. In all cases read the label carefully for crop and soil limitations, a material you can safely use on your apples or pears may seriously injure or even kill your stone fruit.

Tim Smith has produced an ***Orchard Weed Susceptibility Chart*** for North Central Washington that will help you decide which combination of materials will work best for you. It is available at any NWW warehouse.

***Contact materials***

**Credit, , Gly-Star, Touchdown Hi-Tech (glyphosate)** are a systemic materiasl, labeled for use on all fruit crops. They will kill or seriously injure any green plant that they contact. Young tree trunks less than 2" in diameter must be shielded from the material. A chipboard pad stapled around the tree works well for trunk protection. Root sucker contact from a normal weed strip spray on trees that are 4" or more in diameter seems to have no effect on the tree (handgun applications are a different story). Contact with or drift onto a low branch will not materially affect the tree, but may seriously injure or even kill that limb with the damage showing up the year after the application. Glyphosate should be part of the fall weed control tank mix whenever there are perennial weeds to be controlled and the tree can tolerate the material or is protected from contact. The best control is achieved when the concentration of glyphosate is high, (one quart or more per 20 gallons of water) and the application gallonage is low, 20 gallons or less per sprayed acre. Glyphosate is not active in the soil; the material degrades quickly with soil contact.

**Gramoxone Inteon,** is a non-systemic contact materials, labeled for use on all fruit crops. It must be absorbed by green plant tissue and triggered by sunlight or bright light to damage the plant. Weed seedlings will be well-controlled, larger weeds or established perennials will be damaged but will begin to regrow in a short period of time. Young trees with soft bark (stone fruit, pears, some apples) can be severely damaged in the first year of planting, protection is recommended until the bark becomes brown and corky on the surface. Gramoxone works best when the plant is thoroughly wetted with 35 to 50 gallons per sprayed acre, with slow drying and low light conditions. This material should be part of the tank mix where the trees can't tolerate Glyphosate or all of the weeds to be controlled are at the seedling stage. There is no soil activity.

**Weedar 64** (2-4,D) is labeled for use on all fruit crops. It is a systemic material effective only on broad leaf plants, i.e. Canadian thistle, bindweed, fruit trees, etc. This material remains active for a period of time on the ground and will be taken up by the tree if rain or irrigation follows the application within 4 to 6 days and leaches it into the root zone. A low (1/3) rate tank mixed with glyphosate seems to increase the effect of glyphosate on hard to control weeds such as bindweed, perennial clovers and alfalfa with less risk than Weedar 64 alone at full rate. Young trees may be severely damaged during the summer when transpiration is rapid; there is less risk in the cooler fall weather. The most common use is for dandelion and other broad leaf weed control in the drive middles earlier in the year when these weeds are actively growing.

***Residual materials***

**Princep (Simazine)** is available in liquid (4L), wettable powder (80W), and dry flowable (Sim-Trol 90, Caliber 90). It is labeled for Apples, Pears and Sour Cherries only. This was one of the first soil residual materials to be widely used and is still quite effective on annual broad leaf weeds with limited control of annual grasses at a comparatively low cost. It is best tank mixed at a reduced rate with another material that is highly rated on grasses if they are present. Princep can leach into the root zone and damage trees when used on light soils, do not use on trees that have been in the orchard less than 12 months.

**Diuron (Karmex)** is available in liquid (4L) and in dry flowable (80 WDG). It is labeled on Apples and Pears that have been in the orchard for more than one year *except* not for use on full dwarf rootstocks, it may be used on Peaches that are 2 years old if used at a reduced rate and in combination with another material. This is another one of the first residual materials to be commonly used and is also quite effective against most annual broad leaf weeds with slightly more control of annual grasses and some established perennials than Princep. It is best tank mixed at a reduced rate with another material that is highly rated on annual grasses if they are present. Diuron can cause tree damage on light soils, Granny Smith is quite sensitive.

**Sinbar** is an 80 WP, labeled for use only on Apples and Peaches that are at least 3 years old. Do not use on sandy or gravely soils. It is effective on the annual broad leaf weeds, has some effect on a limited number of established perennials, and does not do well on Yellow Foxtail or Witchgrass. Tank mix Sinbar with other materials for control of those weeds.

**Solicam DF** is labeled for use on all fruit crops, but may cause damage on stone fruit, especially if the trees are young or the soil is light or gravely. This is particularly true if it is applied with a hand held sprayer where the rate of material applied cannot be controlled. Apples and Pears are not affected at label rates. Application may be made to apples after the soil is well settled, all other tree fruits must wait until 18 months after planting. It works fairly well on annual broad leaf weeds, has the most effect on established perennials of any of the more commonly used residual materials, and has good control of annual grasses. Solicam is one of the few materials that will provide residual control of common Groundsel. It is a good tank mix material for Simazine, Diuron, Sinbar, and Surflan/Oryzalin. Rainfall or a light irrigation is needed within 4 weeks of application.

**Oryzalin 4 AS (Surflan)** is labeled on all fruit crops and may be applied after the first irrigation or rain has settled the soil after planting. Oryzalin controls weeds by disrupting the growth process during seed germination, it will not control any established weeds and is one of the safest effective materials that we have available for bearing trees. Oryzalin must be tank mixed with either glyphosate or Gramoxone if there are existing weeds that must be controlled. Tank mixing with Simazine, Diuron, Sinbar or Solicam at reduced rates where possible broadens the spectrum of weeds that will be controlled.

**Casaron 4G** is labeled on Apple, Pear and Cherry. The material is very persistent in the soil; careful calibration is needed to avoid leaf symptoms on the tree the following year. Casaron provides a broad spectrum of weed control in both annual and established perennials when used at the maximum rate. Do not apply in the fall until the soil has cooled, just before the first snowfall is perfect timing. Casaron applied on warm soil must have irrigation following immediately to be effective.

**Kerb** is labeled on all tree fruits and may be applied the fall after planting in the orchard. The material is degraded quickly in warm soil, apply late in the fall but before the ground freezes or incorporate with irrigation immediately after application. Kerb is most active on the lighter soils with low organic matter; trees are very tolerant of the material. It controls most grasses and some annual broad leaf weeds.

**Goal** is labeled on all tree fruits for control of annual broad leaf weeds, tank mix with other materials for control of grasses. Goal must be applied after harvest and before bud swell the following spring to avoid possible damage to the foliage, hardened wood is tolerant. There is no age of tree limitation in the label. Goal provides good residual control of common Groundsel.

**Prowl H20** may be applied as soon as the ground has been settled. It provides pre-emergence control of most grasses and some broad leaf weeds, it will not control existing weeds, the mode of action is similar to Surflan/Oryzalin. Cultivation or tank mixes with Gramoxone or Glyphosate where appropriate must be used to control existing weed growth.

## Mouse control

The short-tailed meadow mouse (*Microtus* spp.) is the name of the rodent most growers refer to as orchard mice or voles. The animal has a stout 1.5 to 2.0 oz. body covered with loose, fairly long gray to black hair, small shiny black eyes, and small, fur covered ears. The hairy tail is about 1/3 of the body length.

These mice are very prolific. The female is sexually mature at four weeks, and will produce 8 to 10 litters a year with an average of six young per litter. One breeding pair can produce up to 3000 offspring in eight months, each one consuming its body weight in food daily (remember your hungry teenagers?).

Orchard mice make runways on the surface of the ground and through vegetation by repeatedly using the same routes to feed. Runways are very shallow and may range from only a few inches in length to several feet. In dense vegetation grass and weeds will easily cover a runway complex making it nearly invisible. They also will burrow into the ground; entrance holes are about 1" in diameter.

Orchard mice will only consume bait that they encounter in their runways. To be effective mowing or some other operation that will allow the bait to enter the runway system must precede a broadcast application. If you are baiting by hand you waste anything that is not placed directly in a runway or burrow entrance.

For more detailed identification and monitoring information, consult Extension Service bulletin PNW 154 at any NWW warehouse.

## Control materials

**ZP Rodent Bait** may be applied by hand or broadcast. It will control with one feeding. The material does not weather well and should be applied during dry weather for best results. Most of the control will be obtained in the first 3 - 4 days after application. Bait shyness will reduce the effectiveness of Zinc Phosphide bait if it is used more than once in a three-month period.

**Rozol Paraffinized Pellets** are labeled for broadcast treatment only. This material requires multiple feeding by the mice for control; two applications may be needed for good control of high populations. This material resists weathering fairly well and is a good option for damp conditions.

Each of these materials is labeled for **post harvest only**. Be sure to read the labels for proper rates and methods of application.

## Gopher control

Pocket gophers are active all year but the activity is much more visible in the fall of the year as the animal works closer to the surface while storing supplies for the winter. This is the best time to apply control measures because the shallower tunnels are easier to intercept with a tunnel making baiter or probe with a hand baiter.

Which control method is best (traps, poison bait, gas pellets) will depend on the area to be treated and the population levels.

If you plan to use a tunnel-forming machine, be sure to watch the machine adjustment. If you have to run the machine slightly tilted to keep it in the ground, the bit is dull and you're wasting your time and money. The tunnel you're making will collapse quickly, covering the bait. A pronounced ridge behind the machine with occasional openings into the tunnel is almost a guarantee you're not doing it right. Not only will you fail to control the gophers, you've just created an orchard full of mouse condos wherever the tunnel has collapsed.

Extension bulletin EB 1404 with detailed information on control measures with illustrations of traps, probing methods and tools, and tunnel building machinery is available at all NWW warehouses.

## Soil Sampling

Soil sampling can be done anytime of the year that the ground is not frozen, it is best if it is taken at about the same time of year each time. If you take it now prior to harvest you will have the results back in time to use the information for post harvest soil operations. If you are planning to replant a block you shouldn't miss the opportunity to incorporate needed nutrients before you put the trees in the ground. If you've had growth or vigor problems sample both your soil and water, see next article.

In existing orchards take the sample in the tree row within the drip line of the canopy, not from the drive middle. This will give you a more accurate reading of what is available to the tree.

Sample to a depth of 6" - 8", remove the top 1" - 2" of the sample to avoid contamination by lime granules, etc.

Sample different soil types or areas with different growth patterns separately, the buffering capacities of the soil may differ considerably.

Blend 2 or more of the sample cores per acre taken from the same soil type and depth in a clean plastic bucket. The soil lab usually wants a pint of the blended sample.

Do not mix samples from various depths, i.e. a 2"-8" sample with an 18"-24" sample. The pH values frequently vary dramatically between soil layers, you need that information to correctly analyze and correct your soils if you have a problem.

Do not sample after a recent fertilizer application.

Do not blend samples from different water management blocks, i. e. sprinkler, rill, drip, etc

Ask for a complete soil test, which should include cation exchange capacity (CEC), pH, organic matter (OM), nitrogen, phosphates, sulfates, calcium, magnesium, potassium, sodium, exchangeable hydrogen, boron, iron, manganese, copper, zinc, aluminum, molybdenum, and base saturation point. The cost will be about $50 per sample.

We have soil sample bags available for your convenience; plan about 2 weeks for results to come back.

### Is it something in the Water?

If you don't look close, most of the water we use for irrigation looks as clear and drinkable as the water in the cooler. We forget that water is a powerful solvent. Ground water frequently comes into your irrigation system carrying mineral compounds your trees don't need or want. On the other hand, if it is basically snow melt or rain water it will strip expensive, needed minerals away from your soil as it moves through.

If your soil sample results show a soil that is out of balance with what you need to grow healthy trees, we will suggest that you also take an irrigation water sample. Some soil problems can be solved easier and cheaper with water treatment than with soil treatments.

### Soil Fumigation

Fumigation of orchard soils before replanting does not cost, it pays. The positive effects on fruit yield and economic returns can be measured for the life of the planting.

Nemasol must have irrigation water available at the time of treatment. The material is applied with a weed sprayer while the irrigation system is running. Enough water is applied to drive the material 2.5 to 3 feet into the soil. Trees do not have to be removed prior to treatment.

When working and leveling the ground after either treatment, do not mix soil from untreated areas with the treated planting strip.

For broadcast treatment of large acreage with Telone C-17, contact a custom applicator to determine what soil preparation must be done and by what time to insure treatment this fall.

More complete information and application instructions on soil fumigation are available at all Northwest Wholesale warehouses. Read all label instructions before using.

The guys at the warehouses asked me to include a shot about the use of the fertilizer spreaders. They have been repairing the drivelines on the spreaders due to turning too tight of a radius on corners. They have asked me to please ask growers to **apply on every other row and come back the alternate rows** to make those corners wider. We have replaced u joints and drivelines this summer on more then one of the spreaders. Thank you!