your *Lake County* HORTICULTURAL NOTES

OCTOBER 1993

BEGIN NEXT SEASON'S WEED CONTROL PROGRAM NOW

The phrase "timing is everything" applies to weed control as much as to any other orchard and vineyard operation. Cultivation, mowing and herbicide application cost money; improper timing thus results in lost net revenue - as well as frustration.

Generally, annual weed control is best accomplished at the preemergent or seedling stages. The only control for large weeds is by physical removal or applying postemergence herbicides, which are often only partially successful and often must be repeated more than once.

Some amount of vegetation is generally acceptable - even desirable in row middles. However, it is recommended that the tree/vine row be kept weed-free for several reasons:

1) young tree/vine growth may be severely retarded or even killed by weed competition for water and nutrients;

2) water and fertilizer use efficiency decreases;

3) field mice and gophers build up in weedy habitat, and

4) heavy floor vegetation may be detrimental in a marginal frost and/or russet year such as 1993.

In Lake County, many tree and vine growers have traditionally relied on one spring pre- plus postemergent combination application. This may be followed by one or more postemergent treatments, depending on weed species and density.

Understandably, everyone is mentally, physically and maybe even financially weary after harvesting pears, grapes and walnuts into November. However, adequate weed control is seldom achieved in the spring because 1) weeds are rapidly developing and thus difficult to kill, 2) there is often insufficient rainfall or irrigation to activate soil-applied herbicides (especially a

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problem in furrow or flood-irrigated fields which receive no supplemental water until the first irrigation in late May or early June), 3) heavy weed growth may hinder coverage and 4) high organic matter in soils may tie up a certain amount of the herbicides, exascerbating control problems under weedy conditions.

To observe the effect of timing on the effectiveness of preemergent weed control, a replicated trial was performed in a young pear orchard on clay loam soil (3.4% OM) in Finley. Ten common herbicide treatments and one experimental compound were applied at three timings: December 3 (early winter), February 5 (mid-winter) and March 17 (early spring). Weed control was evaluated on March 17 (first two timings only) and May 29, 1992.

Results are presented below (Table 1). With only several exceptions, the best control was achieved from the December 3 application, regardless of herbicide(s). Applications of all herbicides applied in March, except simazine plus diuron 2+2 lbs. A.I./acre, gave poorer control than December or February applications.

Table 1 Annual weed control with herbicides applied in December, February or March

Evaluated: May 29, 1992

HERBICIDE	RATE lbs./A.I./acre	APPLICATION DATE 12/3/91	2/5/92	3/17/92	avg.
simazine (Princep)	4	5.7	4.5	5.7	5.3
diuron (Karmex)	4	10.0	6.3	7.0	7.8
oxyfluorfen (Goal)	2	6.7	9.0	5.0	6.9
dichlorbenil (Casoron)	4	8.3	8.0	5.0	7.1
simazine + diuron	2+2	6.7	5.7	7.7	6.7
oryzalin (Surflan) + oxyfluorfen	4+2	10.0	9.3	7.0	8.8
oryzalin + simazine	4+2	7.7	8.0	7.7	7.8
norflurazon (Solicam)	4	5.7	4.3	5.3	5.1
MON 13211	1	8.5	7.0	5.7	7.1
MON 13211	2	9.3	8.7	6.7	8.2
UNTREATED	--	4.7	2.3	3.0	3.3
Overall (excluding untreated)		**7.9**	**7.1**	**6.3**	

10 = complete control
0 = no control in the tree row

The above results substantiate other data and long held observation that a late fall-early winter preemergent program will enhance long term control and that spring weed control alone is often a futile remedial "catch-up". Growers who have been relying on one spring preemergent treatment may want to consider switching to a split spring-fall program.

Please contact me for a copy of the full report of the weed control timing trial. Also, for an excellent review of weed management options and materials, contact us for the Weed Management section of the UC Grape, Kiwifruit, Pear or Walnut Pest Management Guidelines (there is a small copy charge for these).

Of course, I am always happy to discuss any aspect of your weed control program.

MORE WEED CONTROL!

The following two articles by fellow UC Extension personnel (with slight editing by Rachel Elkins), address topics of importance to Lake County tree and vine growers.

Puncture Vine - The Plant And It's Control

Ron Vargas, UC Farm Advisor, Madera County

Recently I have received several questions regarding the status of puncture vine, (Tribulus terrestris), in the county. Based upon my own observations and those of many growers, it appears the population of this extremely pesty weed is increasing. Over the past couple of years, I have also noticed its occurance in crop land, whereas it normally inhabits field edges, ditch banks, roadways and waste areas. Because of this awareness, I hope you will find the following information on puncture vine growth, development and control useful.

Puncture vine is an introduced species from the Mediterranean countries which has become widespread in California. It's seeds germinate in the spring (March and April) and it flowers throughout the summer and fall until the frost season. It's an annual weed with greenish grey foliage. The stems radiate from the crown and branch freely. When growing on open land, the plant is mostly prostrate, but when found in crop land, especially alfalfa, it may grow almost erect. It most often grows very much like a vine, producing many burs on its branches, thus its name, puncture vine.

The root system is a simple tap root with an extensive network of very fine rootlets. This system enables this plant to grow under drought conditions and especially enables it to grow and flourish in our sandy soils.

The leaves occur in pairs on opposite sides of the stem. The leaves, as well as the stem are covered with silky hairs which serve as a protective covering from heat and drought. The stems frequently have a reddish color.

The flowers (consisting of 5 petals), which are born in the axils of the leaves are bright yellow. The petals are usually open only in the morning.

The seed pods are clusters of five spiny burs usually growing on the underside of the stem. The pods or nutlets fall apart at maturity and each bur contains 2 to 4 seeds and two hard sharp spines. The seed within the bur remains viable for many years.

Infestations of puncture vine can reduce hay quality and palatability, and cause mechanical injury to animals and humans. Dissemination of this plant occurs easily by animals and rubber tires on tractors and vehicles.

Biological control of puncture vine has been successful in keeping the population at low to moderate levels. Two species of beetles, Microlarinus lareynii, a seed weevil, and M. lypriformis, a stem and crown mining weevil were introduced into the United States in 1961 and are now established in the southwest, including the San Joaquin Valley. Since these introductions, puncture vine populations have been reduced significantly, but as with most bio-control programs, populations fluctuate with its predator populations. At present, weevil populations are low, resulting in an increasing population of puncture vine. As the puncture vine populations increase, providing a greater food source, the weevil population will increase, resulting in lowered puncture vine population.

Control of puncture vine can be most difficult. If the infestation is found along roadsides, or other non-crop areas, the best means of control is to introduce the weevils to the area. Locate puncture vines growing undisturbed, such as along a ditch bank and examine the stem and seed pods for tiny holes which indicate the presence of weevils. Collect infested plants and introduce them to the control area. Do not disturb the area so the weevils can establish themselves. Most often, the population of puncture vines can be lowered significantly with this method, but control will be slow.

If immediate control is desired, mechanical and chemical means may be needed. Cultivation and hand hoeing can be effective. Control with herbicides will vary depending upon the crop that is being infested... Control in tree and vine crops with residual herbicides is erratic as most only provide partial control. If Solicam can be used, control should be adequate. Paraquat and Roundup will provide effective postemergence control if applied to young seedlings.

Effect Of Water Quality On Herbicide Performance

Dr. Larry Mitich, Extension Weed Control Specialist, UC Davis

Minerals, clay and organic matter occurring in water used for applying herbicides (spray carrier water) can reduce their effectiveness. For example, clay inactivates Gramoxone Extra (paraquat) and Roundup, while organic matter inactivates many herbicides, and minerals of various types inactivate 2,4-D amine, MCPA amine, Poast, Roundup and Banvel.

In some parts of California, water is high in sodium bicarbonate, which reduces the effectiveness of 2,4-D and MCPA amines (not esters), Poast, Roundup and Banvel. Water with 1600 ppm sodium bicarbonate occurs, but antagonism of the herbicides mentioned above is noticeable at only 300 ppm. The antagonism is related to the salt concentration. At low salt levels, loss in weed control may not be noticeable under normal environmental conditions. However, the antagonism from low salt levels will cause inadequate control when weed control is marginal because of drought or for marginal tolerant weeds. (Note from Rachel: sodium bicarbonate is not a problem in Lake County well water).

In nearly all situations, high salt levels diminishes weed control. Calcium and, to a lesser degree, magnesium, are antagonistic to 2,4-D and MCPA amines, Banvel and Roundup; indeed, calcium antagonism may become noticeable at 150 ppm. Sulfate ions in the solution will reduce calcium and magnesium antagonism, but to overcome antagonism, the sulfate concentration must be three times the calcium concentration. So for practical purposes, naturally occurring sulfate in water is of little consequence.

An analysis of water used for spraying provides a guide for determining possible effects on herbicide efficacy. Water with more than 150 ppm calcium or 300 ppm sodium or magnesium may inhibit herbicide phytotoxicity. Iron also is antagonistic to many herbicides, but usually it is not abundant in California water. (Note from Rachel: iron is present in some Lake County well water.)

Often, water contains a combination of sodium, calcium and magnesium and these cations generally are additive in the antagonism of herbicides. Many adjuvants are marketed to modify the pH of spray water, but low pH does not appear essential to the action of most herbicides. Adding granular or liquid ammonium sulfate or 28% liquid nitrogen fertilizer to the spray solution helps overcome antagonistic salts.

FALL AND WINTER ZINC DEFICIENCY CORRECTION

Zinc deficiency is the most widespread micro-nutrient problem in California trees and vines. It is vital for shoot growth and leaf expansion, and a consistent treatment program is necessary in certain soils to prevent chronic leaf symptoms, shoot dieback and yield/fruit size reduction. If symptoms and/or tissue analysis has confirmed a zinc problem, I urge either fall (pears), winter (spur-pruned grapes) or spring (all tree/vine crops) treatment.

Grapes - 36% zinc sulfate ($ZnSO_4$) may be applied to fresh, non-bleeding pruning cuts in spur-pruned varieties. Cane-pruned vines are best foliar treated in spring. If soil is dry and it is very cold, consider waiting to apply pre-bloom foliar zinc in the spring. Recommendation for pruning cut treatment is 1 lb. $ZnSO_4$ per 1 gallon water at 2-4 gallons per acre (higher concentrations may cause injury).

Pears - Apply 36% zinc sulfate just prior to leaffall to burn zinc into wood and leaf sites (remember, not before this timing and no oil within 30 days!). Follow-up spring applications of zinc chelate or oxide, although perceived as slightly risky, may be warranted in severely affected orchards. Recommendation is 10 lbs. per 100 gallons water; at least 150 gpa or 70 gpa concentrate rig.

Walnuts - Mark affected trees now and plan to apply 36% zinc sulfate or zinc chelate next spring just after full pistillate bloom when most leaves have lost their reddish color. Several applications may be needed.

Spring recommendations will be given closer to the proper timing, or contact me.

GRAPE POMACE AS A SOURCE OF FERTILIZER

by Peter Christensen, UC Farm Advisor
Fresno County Vine Lines, 11/67

Note from Rachel: several growers have asked whether grape pomace was a good fertilizer. Apparently, the concept is not new. The following was written in 1967.

Grape pomace consists of the skins and seeds left over from winery operation. It is usually spread in vineyards for disposal and as a source of fertilizer. Time and again the question arises as to its fertilizer value depending on winery source and grape variety.

In 1965 and 1966, we conducted a survey by collecting 27 pomace samples from 10 different Fresno County wineries. These samples were analyzed for moisture content and nitrogen, phosphorus and potassium content.

The results were as follows:

	Moisture %	Wet Basis - %			Dry Basis - %		
		Nitro.	Phosph.	Potass.	Nitro.	Phosph.	Potass.
Average all samples	67	.66	.06	.26	1.97	.18	.83
Range	59-82	.45 - .92	.03 - .12	.09 - .58	1.13 - 2.50	.08 - .30	.23 - 1.83

A fairly wide range in moistures is shown with an average of 67%. Thus, you are usually hauling about 2/3 water with fresh pomace, which is fairly equivalent to that of fresh manure.

The nitrogen levels are fairly comparable to that in steer and dairy manure. Also, the nitrogen contents generally did not vary too widely among the wineries. However, the phosphorus and potassium levels were generally lower than those in manures and varied widely among samples.

It was interesting to note no consistent differences in pomace fertilizer value whether it was from seedless or seeded varieties.

Since we are primarily interested in a nitrogen source in vineyards, pomace has a value fairly equal to manure. Seeded pomace also is a good residual organic material as it takes several years for the seeds to disappear.

If you apply 6 to 10 yards of pomace per acre, you apply a good supply of nutrients, especially nitrogen and some fairly resistant organic matter.

FERTILIZER RESEARCH AND EDUCATION PROGRAM CONFERENCE

The goal of CDFA's Fertilizer Research and Education Program (FREP) is to help improve farming practices while reducing nitrate contribution to groundwater. The program facilitates and coordinates research and demonstration programs by: a) providing technical assistance and funding to carry out research, demonstration and education projects; b) improving access of local entities to resources needed to carry out these projects; and c) developing information and serving as a clearinghouse of information required to conduct these activities.

As part of its ongoing outreach efforts FREP invites growers, public officials, agricultural supply and service organizations, pest control advisors and other interested parties to its second

annual conference. The conference is co-sponsored by the California Fertilizer Association and the UC Davis Public Service Research Program. It will be held all day on December 9 at UC Davis.

The conference will feature a keynote address by Dr. George Hallberg of the Iowa Department of Natural Resources. Dr. Hallberg was awarded the 1992 EPA Administrator's Award for excellence in pollution prevention. He will share information about Iowa's successful non-regulatory efforts to reduce nitrate contamination from agricultural sources. Dr. Hallberg will also provide a national perspective on legislation and government programs both at the federal and state level dealing with nitrate in groundwater from fertilizer.

A panel discussion will also be held on the future relationship between agriculture and water quality, allowing for interaction and discussion on the topic. The panel will include representatives from industry, government agencies and growers. Researchers will present results from their FREP sponsored projects on management strategies to minimize nitrate contamination of groundwater from agricultural activities. Various geographic areas, cropping systems and irrigation strategies throughout California will be represented. There will be several talks of particular interest to tree and vine growers. Please contact our office for a copy of the full program and registration form or call FREP at (916) 653-5340.

1993 WALNUT HARVEST

The crop is not huge (except Poes which, in many cases, are loaded), but quality is good and prices appear promising. In December HORT NOTES, I will summarize 1993 field problems and walnut husk fly trap catches. HAVE A GREAT HARVEST!

Sincerely,

Rachel

Rachel Elkins
Farm Advisor