



your *Lake County* HORTICULTURAL NOTES

MARCH 1993

* * * MARK CALENDARS * * *

April 1

April 9

July 12-14

RAVE '93, UC Davis

1993 WALNUT UPDATE, Nice

(see pages 8 and 9)

6th International Symposium on
Pear Growing, Medford, OR
(details upcoming)

FACTORS AFFECTING SUCCESSFUL CODLING MOTH CONTROL

I. Review of the 1992 Codling Moth Season

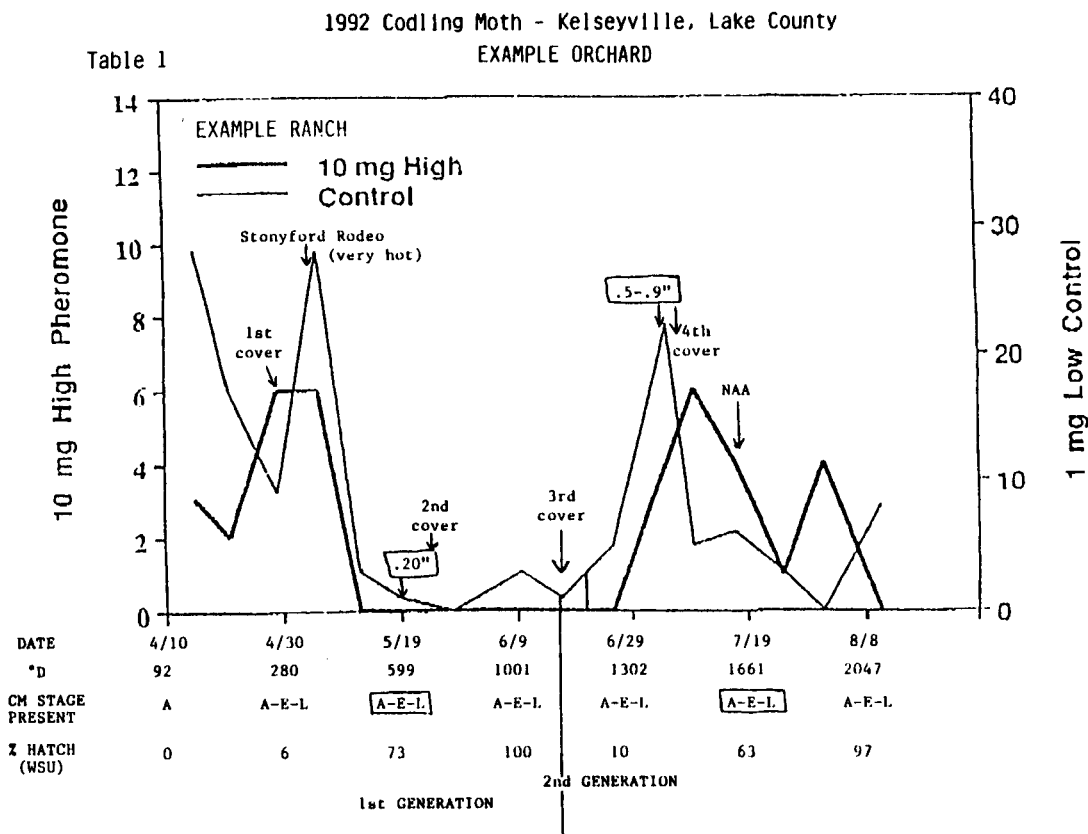
On January 29, 120 growers and others active in the pear industry attended the Lake-Mendocino pest management meeting in Finley. This large attendance mainly reflected great concern over increasingly difficult codling moth (CM) control. Word of resistance to azinphosmethyl (e.g. Guthion), best documented in the Sacramento Delta district, has motivated North Coast PCA's and growers to explore alternative management options, such as mating disruption, biological control and sanitation. Chemical options are few due to cross resistance and the registration bureaucracy. Future CM control will undoubtedly be a combination of chemical, cultural and biological controls, perhaps with mating disruption as the foundation program.

The extent and intensity of CM resistance on the North Coast will be documented by UC and PCA's in 1993. However, increasing seasonal populations, despite more intensive spray programs, point to possible decline in chemical effectiveness. Another aggravating factor is abandoned or under-treated orchards which become enormous insectaries supplying moths to neighboring properties.



In 1992, there were an unusually high number of reports of worms at harvest, attributed by some to resistance. However, in most cases, it is likely that worm damage occurred due to reasons other than resistance. Azinphosmethyl, though under pressure, gave economic control when properly applied at adequate rates and intervals. Upon dissecting the season, several factors, some under grower control and some not, affected control in normally problem-free blocks.

To assist in anticipating and avoiding problems in 1993, the following is a spray-by-spray review of the 1992 season (Table 1).



FIRST COVER (\approx April 29-May 1) - 1991 was a very long season and spring 1992 warm, creating a huge overwintering flight. Timing was 250 degree-days (heat units driving insect development), coinciding with the beginning of egg hatch. A heat spell the first week of May hastened egg-laying and hatch. If first cover was delayed (e.g. down spray rig, out of town, etc.) significant worm entry was possible, resulting in higher second flight pressure. Compounding factors may have been suboptimal rates and COVERAGE.

SECOND COVER (\approx May 18-21) - Treatment interval for Big Valley, the highest pressure area of Lake County, is now more likely about 21-24 than 28 days. Up to .25" of rain fell on May 19, possibly causing residue loss of recently applied spray. Conversely, sprays applied too long after the rain may have overextended the residual, again leaving fruit vulnerable to worm entry.

THIRD AND/OR FOURTH COVER (\approx June 10-13 and June 30-July 2) - Irrigations were going strong and PCA's noted that this delayed cover sprays, again challenging effective residual. On top of this, .5-.9 inches of rain fell (in Big Valley) the first week of July. This likely caused residue loss and treatment delays.

Finally, those had been fine to this point, but delayed final cover until NAA timing, probably ran out of effective residue. Since second generation infested fruit remains on the tree, any of the above events could have resulted in noticeable worms, especially at first pick.

II. Codling Moth Control in 1993 - Are you Ready?

After reviewing last season, what factors can growers do something about? Throughout the 1992 season, one very critical component of the control program undoubtedly played a BIG role - that old nemesis - COVERAGE.

First, are sprayers in top condition, well-calibrated, and being operated at proper pressure and SPEED? That is, are you driving NO MORE THAN 2 MPH?

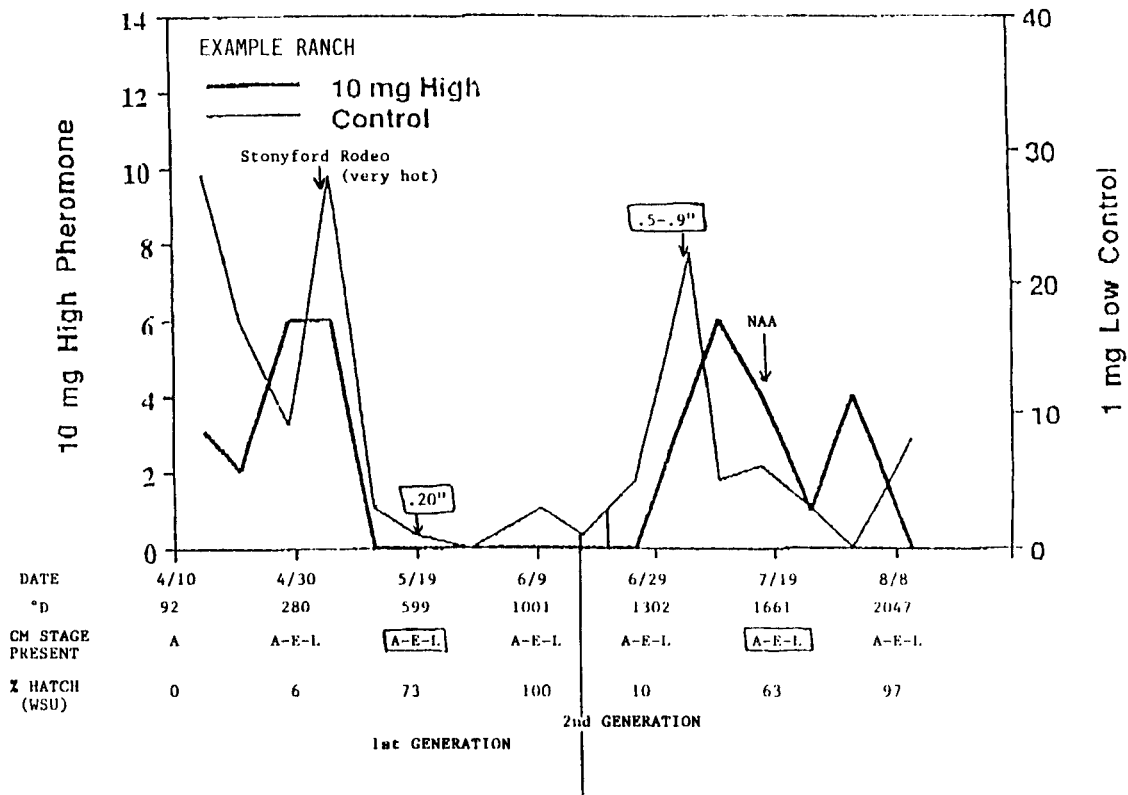
Second, does your spray rig adequately penetrate the UPPER CENTER of trees where CM pressure is greatest and coverage most difficult?! If not, then either the rig or the trees need to be modified! At the January 29 meeting, Extension Agricultural Engineer Bill Steinke stated that the fan must be able to displace all the air throughout the canopy. Also, the power supply, i.e. the tractor driving a PTO rig, must be strong enough. The dense canopy of pear trees during the summer requires powerful equipment as well as conscientious, skilled operators.

Last, and perhaps most important, do you apply sprays WHEN RECOMMENDED? Recommendations are made according to CM biology, not by calendar or at PCA convenience. If applications are delayed, key periods of egg-laying and hatch will be missed. Equipment and personnel should be ready before the season begins. In no case should an application be delayed beyond the recommended time frame, barring heavy rain or some other unforeseeable natural event.

Before the season starts, talk with your PCA. Review the factors affecting control in 1992 (Table 2 will assist you). If you are forthright in your communication, you will find that he/she is truly your friend and will work with you to ensure a worm-free 1993. Please contact me to discuss any aspect of your control program.

Fill in YOUR spray dates

Table 2

**WHAT CAUSES PEAR RUSSETING?**

Dr. Porter Lombard, Professor Emeritus, Oregon State University, Corvallis (reprinted from OSU Extender, October-November 1990)

(Note from Rachel: Readers should be aware that the author refers to Oregon conditions. Growers should discuss their particular conditions with their PCA. Also, growers should become familiar with the research of UC Berkeley Plant Pathologist Dr. Steve Lindow. See page 8).

As pear harvest nears completion, it is sometimes disappointing to see how much of the crop is marked too badly to be in the fresh pack. Sometimes it is very difficult to tell just what caused the fruit marking.

Russetting of pears develops usually as fine cracks in the epicuticular region of pear skin from the injury of weather, pest, and/or spray. I will discuss all three and give possible methods of treatments to avoid the russetting from them. First, I would like to mention that there are several russetted pear varieties, unlike apples, to which Conference and Bosc are the best known. There are also russetted sports of Bartlett and Anjou. But it is of interest to note that there is improved internal fruit quality of the russetted sport in contrast to the green fruit. We don't observe this difference in the red fruited sports. Therefore, we believe that the improved quality of the

russetted fruit is due to the moisture loss of the fruit from the russetted skin. Hence, russetting is only a cosmetic concern and does not decrease the internal quality of the fruit.

Russetting usually occurs in the cooler and more humid regions of Oregon which is partially due to less thick epicuticular layers of the skin. Therefore, thicker epicuticular layers and greater wax deposits on the skin can withstand the cracking and lessen russetting. Also, there is new evidence that hormones such as GA 4/7 could influence the development of the cuticle.

Influence of Climate on Russetting

Spring frost is commonly known to produce frost rings which cause russetting at the calyx end of the pear. Ours and also the grower's observations believe that the critical time for the development of frost rings occurs at the early stages from tight cluster at -7°C or below to the pink stages at temperatures of -3°C . Frost in later stages, particularly in the young fruit stages, can cause a lifting of the cuticle which develops into large blotchy areas that seldom downgrade the fruit.

As mentioned earlier, cool humid weather during the early development of the pear fruit can produce russetting. Recent work in California is looking into the possibility that the bacteria, Pseudomonas syringae, may be associated with this russetting and could be controlled by bactericides. Russetting of Comice and Bosc pears in western Oregon in 1987 has been referred to as a sun rash and was probably due to a wet cool period in June followed by very high temperatures. The sun rash causes small blotches of severe russetting particularly on the exposed side. Solution to the sun rash may be alleviated by well exposed tree canopy for best air movement and drying conditions.

Influence of Pests on Russetting

The most common insect pest involved in pear russetting has been the pear rust and spider mites. The rust mite can be easily controlled by early insecticides, particularly wettable sulfur or Morestan. Spider mites can cause fine russetting at high economic feeding levels of more than five mites per sampled leaf. Anjou is more susceptible than Bartlett but both can show severe leaf burning during periods of high mite levels and this can be a tip off that fruit ressetting could also be severe.

Pear psylla honeydew residue can develop into a smutty mold on the fruit which will eventually mark the fruit with russetting. Overhead sprinklers or rain can prevent a build up of the honeydew residue, particularly in the preharvest period. However, early psylla infestation can produce general russetting of the pear.

Powdery mildew infection can produce a fine russetting on pears, particularly Anjou and Comice. Besides the use of mildewicides for partial reduction, pruning to produce good tree canopy

circulation, and/or the removal of nearby susceptible apple trees, can have a beneficial effect on russetting.

Influence of Spray Injury

Several spray materials, or a combination of materials, and/or poor timing can cause pear russetting. Fixed coppers at high concentrations can cause severe russetting and even cracking on Bosc. But low concentrations of 50 g/100 l (1.75 kg/ha) can be applied when the foliage is dry with little danger of russetting. Low concentrations of copper on Bosc can be used to increase russetting in warm drier regions.

Two or more applications of lime sulfur from early pink through first cover can cause considerable russetting besides reduced fruit set. But a single application at calyx or at first cover is considered safe if it has not been applied at pink stage. Lime sulfur should be applied only to Bartlett and Bosc in pink stage. However, lime sulfur should not be applied to wet foliage. Wettable sulfur can cause russetting at temperatures above 27° C, also.

Combinations of pesticides that cause russetting are: 1) Morestan plus other materials, 2) Morestan can russet Seckel, 3) oil sprays within 45 days following a Karathane application and 4) calcium sprays within 30 days after a summer oil spray.

Since russetting is a primary part of grading of pears, the pear grower must be conscious of the russetting factors and should treat the pear with care from early bud development to harvest.

PREPARE FOR THE 1993 FROST SEASON

Art Horton only tested 104 thermometers this year, so growers were either unconcerned about frost or too busy catching up on pruning and delay dormant treatments to bother. For a change, soil moisture is plentiful and temperatures, thus far, are mild, both excellent conditions to alleviate frost worries. Just in case, however, here is pertinent information for the time of year.

Table 1: EFFECTS OF ORCHARD FLOOR CONDITION ON TEMPERATURES

Bare, firm, wet soil		warmest*
Close mowed cover crop, moist soil	1/2°	colder
Moist soil, low growing cover crop	1/2-1/3°	colder
Dry, firm soil	1 1/2-2°	colder
Fresh disced or loose soil	2°	colder
High cover crop	2-4°	colder
Cover crop with restricted air drainage	6-8°	colder

* The top 8-12" of soil should be wet before protection begins. The ground must be in the desired condition when the frost event occurs so that heat is immediately available to the trees.

Table 2: CRITICAL TEMPERATURES FOR BLOSSOM BUDS

BUD DEVELOPMENT STAGE	CRITICAL TEMPERATURE (° F)	
	10% KILL	90% KILL
separated scales	15	0
blossom buds exposed	20	6
tight cluster	24	15
pre-petal	25	19
popcorn	26	22
partially open	27	23
full bloom	28	24
post bloom	28	24

Table 3: EFFECT OF DEW POINT ON AIR TEMPERATURE

If dewpoint is:	Start Sprinklers at	to <u>maintain</u> :
13-14° F	43° F	40° F
15-16	42	39
17-18	41	38
19-21	40	37
22-23	39	36
24-25	38	35
26-27	37	34
28-	36	33

HORT NOTES ARTICLES ON FROST PROTECTION (contact us for copies)

<u>Article</u>	<u>Issue</u>
The Big Freeze - What Happened?	June 1988
Frost: Advice From a Fellow Advisor	June 1988
Frost Damaged Grapes-Does Shoot Break-out Pay?	June 1988
Which Pears Survived the 1988 Frost Season?	August 1988
Frost Publications-Available at UCCE Office	March 1989
Prepare for the 1990 Frost Season	March 1990
Is it Safe to Combine Wind and Under-Tree Sprinklers?	March 1990
Frost Publications-Available at UCCE office	March 1990
A Note on Dew Point	March 1990
Frost Protection in a Dry Year	March 1991
Frost Protection Factors	March 1991

LAKE COUNTY GRAPE PUBLICATION UPDATED

The publication Information for Prospective Lake County Grape Growers, originally compiled in 1988, has been revised. It includes basic facts about local growing conditions, information sources, winery list, rootstock characteristic table and sample cost studies. It is available for \$4.50 from our office.

1992 PEAR RESEARCH REPORTS AVAILABLE

Contact us for a copy of the 1992 Report on Research Projects for California Bartlett Pears. This summarized research sponsored by the Pear Advisory Board and Pear Pest Management Research Fund. 1992 projects included various codling moth control methods, resistance to azinphosmethyl (Guthion), lowering tree height/summer pruning, fireblight/frost/russet control using antagonistic bacteria (Steve Lindow's research), postharvest decay control, relationship of cultural practices to fruit quality, rootstock evaluation and several post-harvest projects.

MORE THANK YOU'S FOR 1992!!

Fowler Nursery, Newcastle
Beverly Berkeley
Roumiguere Vineyards
John Roumiguere

To pear growers: it looks like it might be an early one! Have a great season.

Sincerely,



Rachel Elkins
Farm Advisor

CULTIVO DE NUECES - ACTUALIDAD 1993 Viernes, 9 de abril de 1993

SESION DE LA MAÑANA

HORA: 8:30 a 12 del mediodía
LUGAR: Nice Community Clubhouse
Carson Way/Lakeshore Blvd. (Carretera 20)
COSTO: \$2.00 para cubrir el alquiler del local

ORDEN DEL DIA

8:30 Inscripción, café
9:00 Bienvenida e introducción
Rachel Elkins, Consejera Agricola
Universidad de California, Condado Lake
9:10 Comercialización de nueces - Repaso
9:35 Investigaciones actuales en nueces y orientación futura
10:10 Tendencias en variedades y siembra de nueces
10:45 Descanso (bebidas/bocadillos provistos por UAP)
11:00 Tizón y cáncer profundo de la corteza del nogal
11:35 Gusano de la naranja de ombligo y otros insectos
dañinos en el condado Lake
12:00 ALMUERZO (por su cuenta)

SESION DE LA TARDE

HORA: 1:30 a 3:30
LUGAR: Alex Suchan Nursery
10005 Elk Mountain Road, Upper Lake
(doble en Mendenhall Road en Treasure Cove Pizza,
saliendo de la carretera 20, siga derecho hacia la
entrada del vivero - siga los carteles indicadores)

**1993 LAKE COUNTY WALNUT UPDATE
Friday, April 9, 1993**

MORNING SESSION

TIME: 8:30 - 12:00 noon
WHERE: Nice Community Clubhouse
Carson Way/Lakeshore Blvd. off Hwy. 20
COST: \$2.00 to cover hall rental

AGENDA

8:30 **Registration, coffee**
9:00 **Welcome and Introduction**
 Rachel Elkins, U.C. Farm Advisor, Lake County
9:10 **Walnut Marketing Review**
 Turner Oylloe, CEO, California Walnut Commission (CWC)
 Dennis Ballint, Marketing Director, CWC
 Mark Villata, Associate Director, CWC
9:35 **Current Walnut Research and Future Directions**
 Dave Ramos, Extension Specialist, UC Davis
10:10 **Walnut Variety and Planting Trends**
 Wilbur Reil, U.C. Farm Advisor, Yolo-Solano Counties
10:45 **BREAK** (refreshments courtesy of UAP)
11:00 **Walnut Blight and Deep Bark Canker**
 Bill Olson, U.C. Farm Advisor, Butte County
11:35 **Navel Orangeworm and Other Insects of Concern in Lake
 County**
 Rachel Elkins
12:00 **ADJOURN FOR LUNCH** (on your own)

AFTERNOON SESSION

TIME: 1:30 - 3:30 P.M.
PLACE: Alex Suchan Nursery
10005 Elk Mountain Road, Upper Lake
(turn right or left at Treasure Cove Pizza off
Hwy. 20, then straight ahead into nursery
driveway - signs will be posted).

TOPICS AND DEMONSTRATIONS

- 1) Replants and interplants
 - pre-plant site preparation
 - proper planting technique
 - post-plant care of young trees
 - training young trees
- 2) Alex's on-farm cover crop research
- 3) Open session - as time permits

***** SPANISH TRANSLATION WILL BE AVAILABLE FOR THE ***
AFTERNOON SESSION**

Spanish language agenda on Page 8

We hope to see MANY growers at one or both very informative and
valuable sessions!

Cooperative Extension
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Oakland, CA 94612-3560

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