



your Lake County HORTICULTURAL NOTES

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NOVEMBER 1990

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WINTER MEETING SCHEDULE
(details in future issues)

November 27-29, 1990 PEAR PRODUCTION SHORT COURSE, Kelseyville
(contact us immediately to register!)

January 23-25, 1991 WINE GRAPE SHORT COURSE, Davis

January 24, 1991 1989 PEAR RESEARCH UPDATE, Ukiah

/Local Grape, Walnut and Pesticide Safety Meetings
*** to be announced***

GRAPE CLONES - JUST WHAT ARE THEY?

Several grape growers have contacted me this fall about "the best" clones of particular varieties. Available selections generally originate from the FPMS at UC Davis, or from certain vineyards known for producing grapes with desirable characteristics. The following article was written by two UC Davis faculty members who specialize in grape genetics and breeding:

"ROMANCING THE CLONE"

Carole P. Meredith and Michael G. Mullins
Department of Viticulture and Enology

"The air hums with talk of clones--good clones and bad and who's doing what with which. And it's not just talk. Clone considerations are influencing major economic decisions, both in the vineyard and the winery. Before you make such a decision, bear in mind that reports on the relative performance of winegrape clones should be judged with considerable skepticism.

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Most of them simply have no scientific basis. This becomes clear when you examine just how much experimental rigor is really necessary to convincingly prove that one clone is different than another.

What Is A Clone?

Clones are definitely real. There is no question that there really are distinct sub-types within winegrape varieties. Differences between these sub-types are genetic differences--they are stable and they are maintained through propagation. These differences are thought to arise as the result of mutations, very small changes in the DNA, the genetic blueprint in each cell that governs every process and structure that makes up the vine. Such changes are natural and normal and occur from time to time in all cells of all organisms. If such a change takes place in a grapevine cell that is destined to give rise to a bud, then the shoot that eventually develops from that bud will be genetically different from the rest of the vine. (This is called a bud sport). Cuttings or buds taken from that shoot for propagation will give rise to entire vines that are now slightly different from the original vine but identical to each other. A new clone is born.

Mutations can affect any process or structure in the vine and may or may not have a visible effect. For example, a change in the gene controlling a specific biochemical step involved in fruit maturation might not change the appearance of the fruit but could have a profound effect on fruit composition. Mutations that are debilitating will tend to be eliminated, since very weak or abnormal canes would not be used for propagating wood. Mutations that result in an improvement may be deliberately selected (as is done in Germany). But most mutations have very small effects and do not result in noticeable differences. Nevertheless, over time and many cycles of propagation, the accumulation of different mutations can result in genetic divergence within a variety and the emergence of clones. It is not surprising that the varieties in which many clones are recognized, like Pinot noir, are very old ones. Relatively young varieties, like Muller-Thurgau or Ruby Cabernet, have just not been around long enough for much mutation and divergence to have occurred.

While most old winegrape varieties undoubtedly have clones, the existence of a specific clone may or may not be recognized, depending upon whether its distinct features are visible ones, like berry size, skin color, or vigor. Differences that are not visible, such as a change in fruit composition, may only be detected if a deliberate search for them is undertaken.

Quasi-Clones

Some 'clones' have their origin not in biological change but in inadvertent recordkeeping errors. A planting may come to be associated with the name of the vineyard from which the propagating wood originated (the 'Jones cone'), even though it is

really no different than other plantings. Nevertheless, having taken on a distinct identity, this planting and all its descendents are often given a clone number and eventually people just assume that this is a real clone with distinct attributes.

Yet another category of quasi-clone has emerged from the practice of heat treatment for the elimination of virus diseases. When a vine has been heat-treated and subsequently shown to be free of known disease, this vine (and all its descendents) is assigned a new clone number to distinguish it from the original clone. Vines from the same source that were heat treated for different lengths of time will each be given a distinct clone number. Whether or not the heat treatment causes any permanent genetic change to the vine, other than the elimination of viruses, is not yet known. Nevertheless, 'clones' that simply have a different heat treatment history must not be considered true clones in the genetic sense.

An additional factor that confounds clonal comparisons is virus infection. Some 'clones' are simply infected with a virus, such as leafroll, that affects vine performance or fruit composition. Confusion between virus status and true clonal difference is common in countries that don't have rigorous clean stock programs. Unless clean stock is used for all clones being compared, there is no way to distinguish between true clonal differences and differences caused by virus infection.

Different Kinds of Differences

It is important to emphasize that most differences between true clones are small and subtle. Differences caused by other factors in the vineyard and the winery are often much larger. Although comparisons among clones often seem to reveal differences, the chances are very good that other factors, not the clones, are actually responsible. If you want accurate information about clones, you must sort out these other factors.

It is obvious that different vineyard sites can differ considerably from each other. Such factors as temperature, rainfall, slope, and the water-holding capacity of the soil have significant effects on grapevines. A comparison between Clone 1 grown in Vineyard A and Clone 2 grown in Vineyard B is just not valid because there is no way to determine whether any differences observed are due to the different vineyard environments or to true clonal differences. Planting the two clones side by side in the same vineyard is also not good enough. Even within a single vineyard there are environmental variables (for example, gradients in soil depth) whose effects must be accounted for if true clonal differences are to be detected. The only way to accurately detect differences between clones is to plant them in a trial that is laid out according to established principles of experimental design such that the effects of all other variables can be separated from the variable of interest, clones. This means lots of replication and careful statistical analysis. Anything less is a waste of time.

And this careful work should not stop in the vineyard. Just as the vineyard is full of variables, so is the winery. To minimize the effect of winery variability, identical winemaking procedures must be used for the clones being compared. And this may not be good enough because even winemaking procedures that seem constant and invariable are subject to some uncontrollable variability. A single wine lot made from Clone 1 may well differ from that of Clone 2, but unknown winery factors may be responsible. Ideally, replicate wine lots should be made from each clone to sort out winery variability from true clonal differences, although this is often not practical.

Some clone information has come from work conducted in Europe. This must be interpreted with great caution. Even if the information has been generated through careful experimental design and statistical analysis (this is rare) and the clones being compared are all free of known viruses (also rare), results obtained in Europe cannot simply be applied to California. It is very well known that genetic differences in plants are expressed differently in different environments. A clone that is highly desirable in France may perform very poorly in California because the two environments are so different. Even within California a clone may perform very differently in different regions.

There are no easy answers to clone questions. Before making an expensive clone decision, you would do well to cast a critical eye on the information you have. Is it free of all the weaknesses described above? Not likely--there has been very little convincing clonal evaluation work conducted in California, although some is now underway. With time, we may well get an accurate picture about how specific clones perform in different California regions, but until then, be skeptical!"

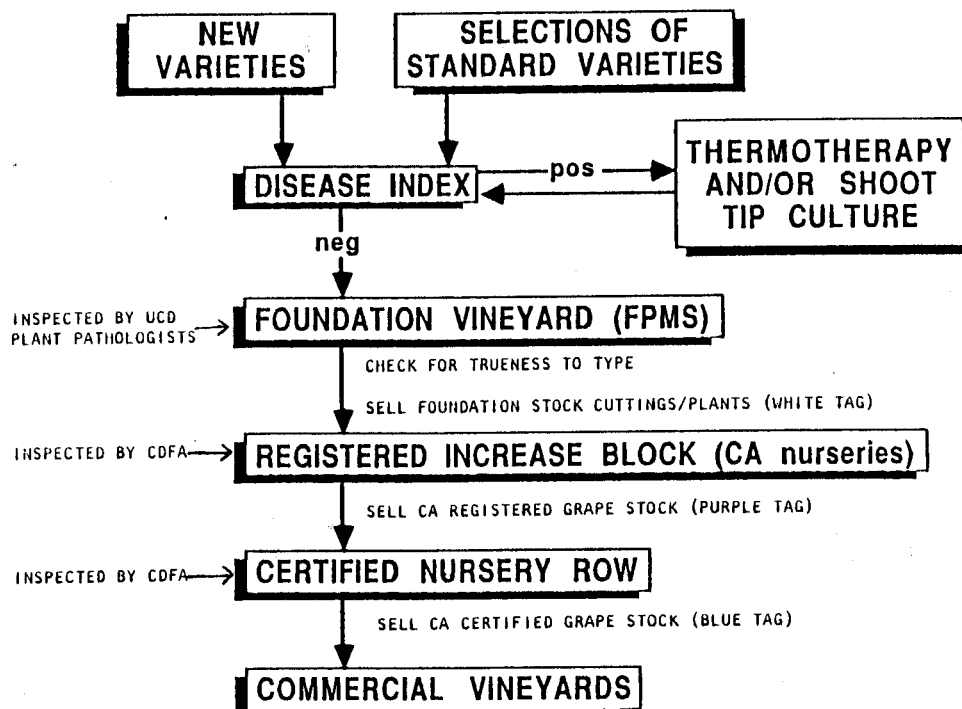
GUIDELINES ON CHOOSING GRAPE ROOTSTOCK

University of California Foundation Plant Material Service (FPMS) has recently published "Advantages of Planting with California Certified Grape Stock". This brochure is available free of charge from our office or the Lake County Grape Growers Association (263-0911). It answers the following important questions growers should ask before purchasing stock:

- 1) Why should I be selective about the planting stock used to establish a new vineyard?
- 2) Can I determine whether my planting stock is disease-free and true-to-variety with a visual inspection?
- 3) How can I be sure that my planting stock has been propagated from vines that were tested for disease and checked for trueness to variety?
- 4) Does a certified tag mean that the stock is true to variety and free of disease?

- 5) What additional information should I ask the nursery to supply for the certified stock I plan to purchase?
- 6) Can non-certified material be as good as certified stock?

For those of you unfamiliar with FPMS and its function, contact us for a copy of their descriptive brochure, "Foundation Plant Materials Service". Very briefly, the following chart identifies the role of FPMS:



Currently the FPMS and the grape industry are working toward establishing a National Grape Importation and Clean Stock Facility at Davis in order to hasten and streamline the introduction, indexing and clean up of new varieties into the U.S. As of June 1990, Congress had appropriated \$130,000 to plan such a facility.

WALNUT HUSK FLY TRAP CATCHES

The main emergence in 1990 appeared to occur from August 10-21, with an additional "wave" around September 11. Thus, sprays were probably most effective around the second or third week of August and again a month or so later. HOWEVER, SPRAYS SHOULD BE APPLIED ACCORDING TO YOUR CATCHES. If your orchard sustained WHF damage, go over trap catches in relation to application timing. If traps were not utilized, plan on hanging them next season. With only short-residual materials available, proper spray timing will be much more critical in the future, as will the use of attractive bait.

TRAP LOCATION

<u>DATE</u>	<u>Finley</u>	<u>Nice</u>	<u>Upper Lake</u>
7/27	1	3	0
8/3	0	6	2
8/10	4	4	6
8/14	2	3	2
8/21	1	44	2
8/28	0	6	1
9/4	0	1	0
9/11	-	43	2
9/18	0	4	0
9/24	1	11	1

UC ANR PUBLICATIONS AVAILABLE (contact our office)

Small Farm Center Composite Publications

- 1) Statistics and Resources ANRP009 \$2.00
 - Small Farm Directory
 - Research/Education Needs of Small Scale Farmers in California
 - California Small Farm Profile
 - Small Family Farms in California: The Definition Dilemma
- 2) Marketing ANRP010 \$3.00
 - Direct Marketing and Quality Control
 - Marketing Cooperatives
 - Setting up a Roadside Stand
- 3) Farm Management ANRP011 \$2.00
 - Considerations in Enterprise Selection
 - Farm Leases and Rents
 - How to Determine Your Cost of Production
 - How to Finance a Small Farm

Agriculture in California: on the Brink of a New Millennium
AIC-2010 \$10.00

Series of analytical reports by UC staff on issues critical to the future of agriculture: production, environment and natural resources, marketing, education, research.

ENVIRONMENTAL LIABILITY: WHAT THE AGRICULTURAL PRODUCER SHOULD KNOW

In the last few years, environmental contamination and the associated liability has become a pressing issue for all businesses that use hazardous or toxic materials, including agriculture. Transactions or contracts involving agricultural properties automatically raise a "red flag."

For the agricultural producer, potential liability for the clean-up of contaminated property is affecting access to farm credit, agricultural real estate transactions, and even agricultural leases. Growers applying for production or real estate loans, for example, should be prepared to answer detailed questions about whether the property ever contained any surface or underground storage tanks, or whether there are any records of chemical or waste spills.

To best cope in this new business environment, agricultural producers and those who serve them need to be familiar with the basic issues of environmental liability. The University of California Cooperative Extension and California Farm Bureau are co-sponsoring a day-long educational meeting to answer questions that agricultural producers, rural appraisers, real estate agents, farm lenders, and others have about environmental liability as it affects farm businesses. Topics to be covered include legal developments in environmental liability, impacts on farm loans and real estate transactions, the ins and outs of environmental site assessments, and the role of regulatory agencies in the handling, storage and disposal of hazardous materials.

The meeting, beginning at 8:30 a.m., will be held in Winters at the Community Center on December 11, 1990.

The \$30 registration fee includes a continental breakfast and lunch. Detailed agendas are available from our office or from Agricultural Economics Extension at U.C. Davis, (916) 752-4424.

BREAKING NEW GROUND

"Lifting Barriers for Farmers with Physical Handicaps" is the theme and motivation for the Breaking New Ground Resource Center of Purdue University in Indiana. The Center grew out of studies that documented the impact of farm-related accidents on farm families. The Center offers a free newsletter and other resource materials containing practical information to assist disabled farmers. Contact them at:

Breaking New Ground
Department of Agricultural Engineering
Agricultural Engineering Building
Purdue University
West Lafayette, IN 47907
(317) 494-5088

Sincerely,

Rachel

Rachel Elkins
Farm Advisor

Happy Thanksgiving
to all !

