

## Windbreaks

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*Orange County*

Talk delivered at Association Annual Meeting, at Whittier, May 8th, 1934

Mr. Chairman, ladies and gentlemen:

First of all let us stand up and rest a little bit. I want to tell you something about windbreaks, but before I do I want to say something about our honored guest, Dean Hutchison.

When you realize what Dean Hutchison has done for agriculture in general, and for this industry in particular, it is fitting at this time to say something about him.

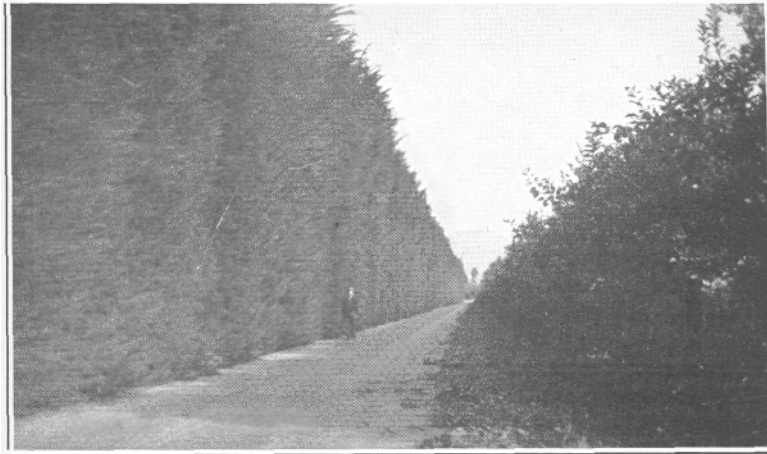
Do you realize that four men out of Dean Hutchison's department, Messrs. Tulley, Wilcox, Stokdyk, and Tingling, were so well qualified that they were borrowed by the U. S. Government for its particular farmers' reconstruction program. Besides this group of men, there are six more of Dean Hutchison's men right here in this audience who live with us, are interested in our industry, and are of great value to Southern California, agriculture. They are, James France, Professor Hodgson, Vincent Blanchard, Harold Wahlberg, Marvin Rounds, and Professor Home. We want to thank you, Dean Hutchison, and to tell you that we appreciate the valuable services of these men. Also we want you to know that we appreciate the stand that you took in the labor investigation during the critical times last summer.

There is another thing, Dean Hutchison, that I should like to mention at this time. On the 7th of February, a red scale committee was appointed by the Lemon Men's Club to make plans for another journey of exploration in foreign fields to search for beneficial enemies of the red scale. Of course we wanted your man Harold Compere to do the job. Harold Compere is perhaps the outstanding man in the world today in this line of business. It was Harold Compere who, a few years ago, brought in from Australia the natural enemies of the citrophilus mealy bug, and as you know, these natural enemies have since that time kept this serious pest in control.

There are two countries left in the world which have not been thoroughly prospected as a source of red scale parasites. These countries are South America and Mexico. The citrus industry asked to have Mr. Compere sent abroad. The University offered to pay his salary and the industry as a whole agreed to pay the balance of his expenses. Representatives of all the fruit marketing organizations of Southern California met and cooperated in this effort, and as a result of these conferences, Mr. Compere is in Mexico right now searching for new enemies of the red scale. Right here I want to say that we thank you, Dean Hutchison, for your share in this valuable work, and I want to say also to the avocado men gathered here today that the citrus industry realizes that to maintain itself as an active and virile organization, and to show good faith in the

University, it must do something for itself. The fact that .the industry taxed itself so much per car to help defray the expenses of Mr. Compere for this valuable expedition during these trying times is proof that citrus people have faith in themselves and faith in their great industry.

Now on the subject of windbreaks. I will endeavor to give you a summary of my observations on this subject over a period of years, particularly in Orange and Ventura counties where the East and the West winds seem to originate.



Excellent windbreak of Monterey Cypress on George Power Ranch at Ventura.

First of all let us discuss the damage done by East winds. It is common knowledge that hot East winds burn the trees by taking water out of the fruit and leaves faster than the roots can supply it, and the breaking down of the tissues is the result. It is simply a process of dehydration, the same as that of walnuts. Dehydration is a process of moisture extraction, and this process is speeded up as the temperature and velocity of air increases. On the other hand, anything that lowers the temperature and velocity of wind decreases the rapidity with which moisture is extracted from the trees. Windbreaks do this very thing.

Orchards planted in a windy country without protection gradually become weakened by successive winds, produce scarred and inferior fruit, and very soon become marginal groves. An East wind survey, made by Harold Wahlberg in Orange county showed that protected orchards on an average produced \$90.00 more per acre than those orchards which were exposed. I would rather have the net proceeds of a ten-acre orchard which produced high-grade fruit than the net proceeds from a 100-acre marginal grove.

Now West winds are another thing. All along the coastal districts anywhere from 10 to 15 miles inland, these cold West winds do a lot of damage. They are chilly, and they are laden with particles of salt. These chilling winds not only continually agitate the trees and prevent normal growth, but they actually lower the temperature of air and soil, which is very detrimental. Furthermore, steady winds of any sort cause evaporation of moisture from the surface of the soil and cause alkaline salts to rise to the surface through evaporation. Again, there is little doubt but what the salt carried by West winds

does considerable damage to the foliage of citrus and avocado trees.

In Ventura county, the company with whom I am associated, is developing and operating a young orchard located very close to the ocean. We have found it necessary to plant windbreaks as close as 330 feet apart, and have observed startling results in the growth and productivity of lemon trees or beans that are planted close to these young windbreaks on the east side where they are protected from the West winds. We placed thermometers in the ground 12 inches deep in two places, one close to a young windbreak on the East side, and the other one 200 feet away in the exposed part of the orchard. This test showed that the temperature of the soil near the windbreak was two or three degrees warmer than the soil in the exposed area.

Mr. Blanchard has made some observations as to the damage done by East and West winds in Ventura County, and if you had heard him talk you would think that he had windbreaks to sell. Mr. Blanchard observed that the first seven rows of trees in a young orchard that were protected from the West wind by a windbreak 25 feet high, produced as many lemons as were picked from the 17 rows in the same orchard that were exposed.

In January, 1933, an East wind swept through our ranch and defoliated the young trees in a 30-acre block. These trees had just commenced putting out a little new growth when the strong, cold, West winds of April and May, 1933, swept through this same orchard, and put the finishing touches on them for that season. This orchard was set back a year or more on account of these attacks of East and West winds.

Because of our windbreaks being so young, and on account of the persistency of the cold West winds, we planted rows of corn 50 feet apart in a young orchard where we were growing an intercrop of lima beans. As a result, although we lost a few rows of beans on account of the corn, the protection from West winds during the summer of 1933 allowed the lemon trees to make a normal growth, and actually increased the bean yield by some ten sacks per acre over adjoining exposed fields.

What I have said with regard to damage done to oranges and lemons by East and West winds pertains also to avocados.

The San Joaquin Fruit & Investment Company ranch in Orange County is composed of 1250 acres. When the owners of this ranch set out the original trees they planted windbreaks 450 feet apart. They realized that windbreaks do considerable damage to adjacent rows of fruit trees, but they also realized that they were located in a windy country, and that it is not so much a question of how much damage a windbreak does as it is how much good it will do. Down here you simply must make up your mind between having windbreaks with some damage or unprotected orchards with poor crops. The success of the Fruit Ranch has been largely due to its protection from wind. When, in 1922, a large portion of this orchard land was sold, the owners of the Ranch, in order to guarantee to every buyer the advantage of the accumulative effect of a series of windbreaks, put a clause in every deed that if any tree in any windbreak was removed by any owner of land that his land would revert to the original owners.

While on the subject of windbreaks, let us go back to their origin, and say something about the early pioneers. When these hardy men came to Southern California, they

found great expanses of rich valley soil, lying in a land of perpetual sunshine. It took many years, however, of struggle to capitalize on these natural advantages. First of all these men went into mining, then into sheep and cattle raising, gradually into the growing of vineyards, then deciduous fruits, finally into the growing of citrus, and last of all, avocados.

When these men began to realize the possibilities of growing semi-tropical fruit crops in Southern California, they began to make organized efforts to overcome their great natural handicaps which were shortage of water, an over-supply of devastating winds, and a lack of regulated markets.

The first thing they did was to form mutual water companies for the production and conservation of irrigation water. Next they found that in order to grow successful tree crops they must protect their orchards against wind. The planting and use of tree windbreaks soon became a recognized necessity, and thus we have the origin of the windbreak.

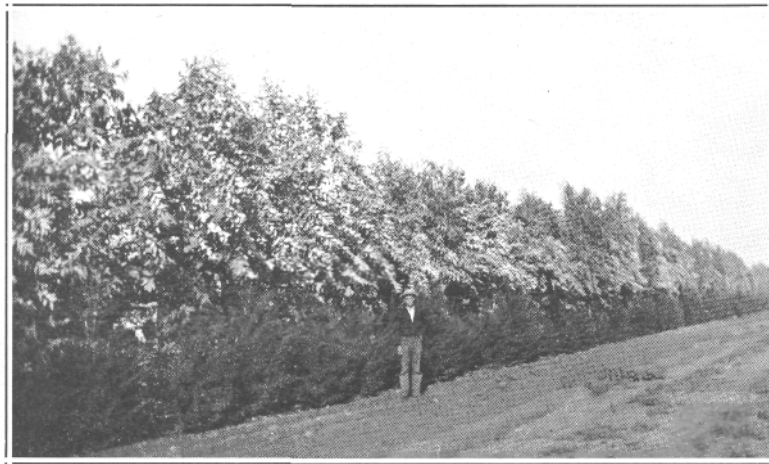


Photo taken at Utt Development Co. Ranch, Ventura Co. Nov. 15, 1934. Young Eucalyptus with supporting filler of Monterey Cypress.

Orchards began to flourish, and great crops of perishable fruits were produced. Markets were demoralized. These same hardy men recognizing the fact that California is isolated from the markets of the United States by mountain ranges and great distances, realized that if they were to receive any profit from their orchards they must organize in order that they might cooperatively advertise and distribute their products in an orderly manner. Thus again we have the origin of our great cooperative marketing organizations and the stabilizing of Southern California's agriculture.

The universal planting of windbreaks decreased the velocity of winds to such an extent that when Eastern people began coming out to Southern California and buying orange groves, they, lacking experience and seeing no need for windbreaks, began taking out these valuable assets. One man took out a gum row and planted a row of orange trees. He was surrounded by other protecting windbreaks, and he received no damage. Next year his neighbor did the same thing. He was still protected by his neighbors, and did

not need to maintain a windbreak for protection. Then the idea became general. Miles and miles of valuable windbreaks were taken out, and the hot East winds swept through these districts as of old. Crops were torn off, trees were damaged, values were reduced, and then the orchardists woke up to the fact that organized effort is necessary to success. The individual must cooperate with his neighbor to maintain universal windbreaks, mutual water companies, and organized marketing.

We have spoken at some length concerning the advantages of windbreaks. However, we are not blind to the damage that is caused by them. We know, through careful observation, that oftentimes the first two rows of trees next to an old windbreak have an average of 25% less fruit than a like number of rows in the center of the orchard. However, the damage done by windbreaks to adjoining orchard trees can be largely overcome by a well advised program of root cutting. Beginning when the trees are two or three years old, roots can be cut by heavy subsoilers, or by ditch digging machinery, to a depth of anywhere from 36" to 48", and much of the damage can be thus eliminated. As a result of root cutting once or twice a year and special attention to irrigation, we have been able to grow good trees within from 25 to 30 feet from old gum rows.

We also know that anything which interferes with the free movement of air increases frost hazard, and therefore a windbreak protected orchard is apt to be on the average a little colder than a grove in the open. There are times, however, when severe frosts are preceded by strong and cold North winds. In this case the unprotected orchard is mechanically bruised and weakened by the wind and is, therefore, damaged worse by the frost following than is the protected and physically strong orchard.

Remember this, fellow growers, that a mule is no better than his feet, and that an orchard is no better than its windbreak. Also remember that you can get up at midnight and light some orchard heaters, but there is no use getting up at midnight to plant a windbreak.

Well it looks as though we are going to have to live with our windbreaks, and take a little damage, if we are going to grow successful orchards. The question is then, what windbreaks to plant, and how to take care of them.

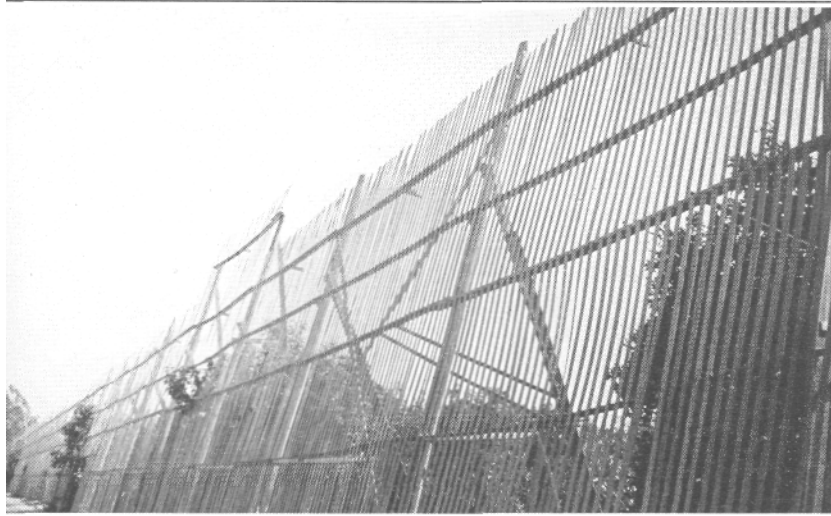
We believe that Eucalyptus Globulus is the ideal windbreak for quick growth and maximum height. These trees should be planted early in the spring, February and March. They should be planted from five to ten feet apart, depending perhaps on the vigor of the soil, and only small plants from 6" to 8" in height should be used. These tender young trees should be given excellent care during the first year or so if one is to get the maximum results. I believe it is well, after one finishes planting the windbreak, to put a few trees in paper containers 5" in diameter by 12" in depth. These trees will grow vigorously, will establish a good deep root system, and can be used during the following four to six months as replants in case of accidents to any of the trees in the main row.

We believe that there should be a secondary windbreak planted about six feet away from, the main row of eucalyptus. The ideal tree for this secondary or filler row is Monterey cypress. However, the Monterey cypress has developed in recent years some very serious pests which makes the planting of this cypress tree rather hazardous. There is another tree which can be used as a filler, the Eucalyptus Globulus Compacta.

This latter tree is just what the word implies, a low growing, bushy, gum tree, and I believe is rather ideal for this purpose.

There is a cypress tree, native to Southern California, which is growing in the hills within 20 miles of where we are sitting, and this native tree is apparently immune to the Monterey cypress pests. This group of native trees was discovered by Mr. Carl B. Wolf, supervising botanist for the great botanical project of Mrs. Susanna Bixby Bryant. Right here I want to express the gratitude of residents of California to Mrs. Bryant for this project of hers which is now under way and which contemplates the gathering and growing on her estate in Santa Ana Canyon of all the trees and plants native to California. This is one of the most valuable and outstanding contributions that in my mind has ever been made for the education and pleasure of nature loving people.

As to artificial windbreaks, suffice it to say that many artificial windbreaks of rabbit wire, wooden slats, and various other materials, have been constructed at various heights in various parts of the country, and have apparently, when properly constructed, given pretty good results. I should like to think that these artificial windbreaks are temporary expedients only, because I believe that when an Eastern man comes to California to buy a grove and to make a home, that he would much prefer to have a grove surrounded by beautiful trees rather than one which is cluttered up with unsightly wooden windbreaks. However, this is just my personal feeling about the matter.



Lath windbreak at the Howard H. Gardner Ranch at Villa Park, Orange County.

Summarizing these rambling ideas, I want to add this thought. There are several points which I want to bring out that seem to me to be absolutely pertinent to the success of growing fruit. Among these are quality of land, quality of trees, wind and frost protection, a proper marketing organization, and finally, the man on the job.

The lack of consideration of any of these above points will greatly reduce the grower's chances for success. The proper consideration of them assures a man of a fighting chance to succeed. There is an old Greek proverb, which states, "God feeds the birds,

but he doesn't throw the feed into their nests." Our Creator is not going out to find us markets, or to build dams, or to plant windbreaks.

Cooperation is the thing that has made California's agriculture famous. A Mexican proverb runs like this: "In the land of the blind the one-eyed man is king." This simply means that the fellow who cooperates and plants windbreaks will succeed.