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FROST PROTECTION

Joe Murphy

(From a letter to the Society, extending an article by Mr. Murphy in the 1950 Yearbook)

Last winter passed without incident; had some nights of 26 degrees minimum, but these cold spells were of short duration and were easily taken care of by the wind machine without supplemental heat.

This winter started out in the old familiar pattern. On the night of 12-9-51 we went into action at 9:00 p.m. with 28 degrees in lower edge of grove. (We have a similar protection problem as the Socin grove mentioned in last year's article.) We ran the machine for eleven hours, and from 11:00 p.m. to 7:00 a.m., we fought temperatures from 25 degrees to 20 degrees. This 20 degree business lasted from 3:00 a.m. to 7:00 a.m.

We had about a hundred return stack heaters going for eight hours on twelve acres in front of the oscillating machine, and did quite a job with the set-up. We maintained minimum temperatures from 27 to 28 ºF.

Our damage was confined to the blossom in advanced stage of development, and the extreme tips of the unhardened fall flush growth (this includes about 300 year-old tip grafts, and these are plenty tender).

The most remarkable thing about this test was that behind the oscillating machine, where nearly all night temperatures were 22 to 25 degrees, healthy trees stood this with the loss of only well developed bloom and a few stems of outside fruit frozen.

Apparently, Fuertes will come through several hours of 22 to 25 degrees if they stand in the draft created in back of the oscillating machine. We estimate this draft as about eight miles per hour, and it exists for about 25 yards behind the machine.

On 1-4-52, we ran eleven hours through another 22 to 24 degree night with heaters on about half the time. No further damage to trees occurred.

We found that we get a definite protection with this system on the far side of hills within range of the machine blast. Trees on the far slopes, including tip grafts, seem to fare as well as those under the direct air currents produced by the machine.

This suggests to me that we are producing a mass movement of air, preventing the cold air from piling up in the draw. In effect, we are simply assisting the natural air drainage. It would appear that this mass air movement is much more effective than the slight rise in temperature that comes from mixing the warmer upper air layer with the cold lower layer. Of course, there comes a point (about 25 degrees) where heat must be added, else one gets a super cooling effect from the air blast, *a la* the deep freeze process, with immediate and great damage to trees near the machine.