

RESPONSE OF VEGETABLES TO FLOATING ROW COVERS AND PLANT PROTECTORS IN CENTRAL OREGON

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ABSTRACT

The effect of Vispore and Reemay floating row covers and Wallo'Water plant protectors on tomatoes, cucumbers, and sweet corn was observed at Madras and Redmond in 1984. Wallo'Water gave very effective frost protection and did extend the growing season for tomatoes and cucumbers. Ripe tomato yield was similar from Vispore and Reemay covers although there appeared to be significantly more green fruits from the Reemay. Vispore was beneficial in hastening maturity and increasing the ear yield of sweet corn. Use of floating row covers and Wallo'Water plant protectors could be helpful to home gardeners for frost protection and yield increase of vegetables.

Vegetable production is either eliminated or seriously limited in many Central Oregon localities because of low air and soil temperatures and the length of the growing season. Several methods are available for home gardeners to stimulate early production and/or extend the growing season, including transplanting, clear or black plastic ground mulches, hoop-supported plastic tunnels, floating row covers and rigid or semi-rigid structures. In 1984, the Central Oregon Experiment Station in cooperation with the Oregon State University Deschutes County Extension Service conducted some non-replicated tests with floating row covers and a plant protector called Wallo'-Water to determine effects on production.

MATERIALS AND METHODS

Two floating row materials, Reemay, spunbonded polyester (DuPont Co.) and Vispore, finely perforated clear polyethylene (Ethyl Visqueen Corp.), were applied after planting. The Wallo'Water is an 18-inch tall cylinder made of 6 mil clear polyethylene plastic. Its two layers are heat sealed at three-inch intervals, forming 18 vertical pockets which are filled with about three gallons of water. It is rigid enough to stand by itself and surrounds an area about 14 inches in

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diameter (Figure 1). These protectors were either placed over the soil in which seed was planted or over the transplants.

Madras. Transplants of Early Girl tomato were set out on different dates starting May 1 and covered with the row materials and Wallo'Waters as shown in Table 1. Seed of Straight Eight cucumbers, a 65-day maturity table type, was planted. Cucumber fruit were picked when they were about four inches long. Wallo'Waters were removed the first part of June on the cucumbers.

Redmond. Three transplants of cherry tomatoes were set out on May 3 with and without Wallo'Waters. The Wallo'Waters were removed July 10. Other transplants were set out June 7 and 11. Two 50-foot-long rows of sweet corn were planted May 24, one row each of Golden Jubilee and Golden Hybrid Blend (20% each of Yukon, NK51036, Wonder Gold and NK 199 plus 10% each of Golden Cross and Queen Anne). Immediately after planting, 20 feet of each row was covered with Vispore. Corn seedlings were thinned to about eight inches between plants when they were about four inches tall. Ears were picked from both treatments of each variety at fresh market maturity.

Table 1. Effect of row covers and plant protectors on tomato fruit yield, Madras, Oregon, 1984

Trans-planting Date	Type of Cover	Ripe fruit Yield (lbs/plant)	Total Yield ¹ (lbs/plant)	First Harvest of Ripe Fruit
May 1	Wallo'Water	26	56	Aug. 28
May 15	Wallo'Water	25	55	Aug. 28
May 15	Vispore	13	35	Aug. 28
May 15	Reemay	12	50	Aug. 28
June 1	Wallo'Water	11	51	Sep. 5
June 1	Vispore	11	39	Sep. 5
June 1	Reemay	13	59	Sep. 5
June 18	No Cover	3	16	Aug. 28

¹ Total yield includes green and ripe fruit.

RESULTS AND DISCUSSION

Madras. The Wallo'Water on transplants May 1 gave protection from frosts or kept them living but there appeared to be no advantage over the May 15 date after which more favorable temperatures for growth occurred (table 1). There was no difference in the time first ripe fruit was harvested. From the May 15 transplants those surrounded by the Wallo'Waters yielded more ripe fruit than those under Vispore and Reemay. The

Reemay seemed to be more effective in stimulating additional fruiting, although they did not ripen by August 28, than Vispore cover. Reemay also exhibited this same effect when placed on June 1 transplants. Both covers and Wallo'Waters had beneficial effects on tomato yields compared to the use of naked transplants set out June 18. Temperature measurements were not taken but it was evidently more favorable under covers and Wallo'Waters. And, the soil temperature was probably higher for a longer time into the night. Research with these products by other persons indicate that the Wallo'Waters have given protection to 16°F and the row covers to 4-5°F below freezing.

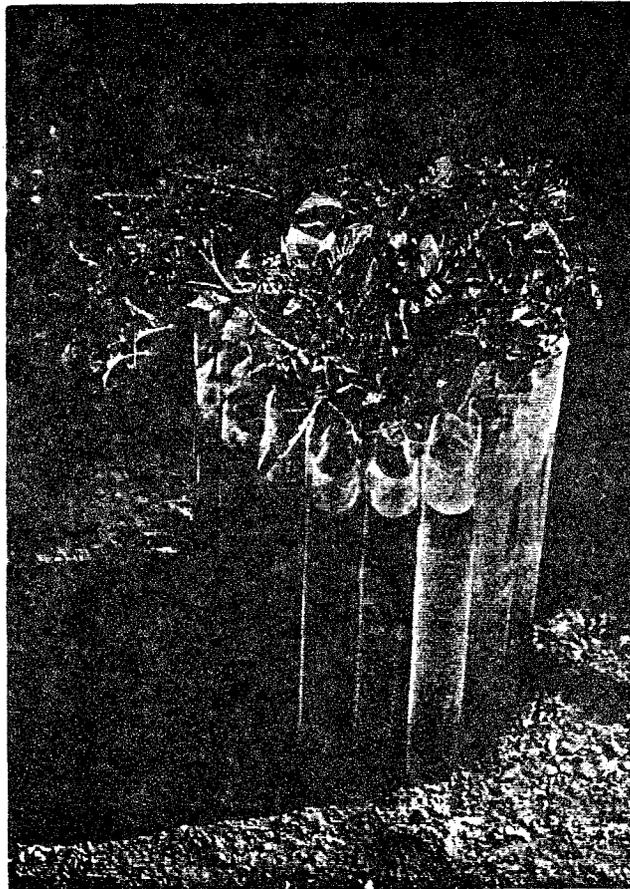


Figure 1. Free standing Wallo'Water (around a tomato plant) put in place at transplanting time.

The Wallo'Waters protected the cucumbers from frost. Fruit were available for picking about three weeks earlier than cucumbers without Wallo'Waters from the June 1 planting (Table 2).

Table 2. Effect of Wallo'Water vs. no protection on yield of cucumber fruit, Madras, Oregon, 1984

Planting Date	Cover Type	Total Yield (lbs/hill)	First Harvest Date
May 1	Wallo'Water	15	July 25
May 15	Wallo'Water	29	July 25
June 1	No Cover	32	August 14
June 18	No Cover	4	September 5

There did not appear to be an advantage to Wallo'Waters in increasing total yield of fruit compared to their absence.

Redmond. The three tomato transplants set out May 3 without Wallo'Waters died as a result of the 25°F temperature the next morning. The three protected plants continued to grow and by July 10 were about 32 inches tall, approximately 14 inches of growth above the top of the Wallo'Water. Three tomato transplants were set out June 7 but the 28°F temperature that night or early the next morning killed all plants. Three more transplants, set out without protectors June 11, survived. Transplanting time can be quite a guessing game each year which the Wallo'Waters can eliminate. The picking of cherry tomatoes began August 3 from the May 3 Wallo'Water plants compared to August 23 for the June 11 transplants. No data were collected on total numbers or weight of ripe or green fruit. However, the advantage of the Wallo'Waters was demonstrated.

One week after planting corn, seedlings of both varieties under Vispore were from one-half to one inch tall compared to the tip of the first corn leaf just visible above the ground on the rows not covered. On July 10, 47 days after planting, the Vispore was removed. At this time, the corn plants were 24-26 inches tall compared to 14-18 inches for plants that had no cover. A temperature reading of 80°F six inches above the soil was recorded under Vispore compared to only 75°F under no cover. The tips and margins of corn leaves close to and touching the Vispore were burned and the plant tops were bent over under the cover. However, they straightened up in a few days after the Vispore was removed. On August 3, pollination was occurring on plants of Golden Hybrid which had Vispore cover but none was observed on plants without the cover. For Golden Jubilee, Vispore-treated plants had fully emerged tassels compared to tassels starting to emerge on plants that had no cover. Ears were ready for harvest about a week earlier from the Vispore treatment on Golden Hybrid (Table 3). It appeared that Vispore helped each corn variety to mature about a week early. There were fewer plants treated with

Vispore. The data indicate that the total number of harvestable ears from Golden Hybrid by September 11 was also greater from Vispore compared to no Vispore treatment. Ears of Golden Jubilee were obtained on September 11 only from plants covered early in the season with Vispore. From a September 11 examination of the ears on non-Vispore-treated plants it was estimated that they needed about 10 days or more to reach maturity.

It appears from these limited observations that the Vispore row cover was beneficial in getting more ears earlier in the season compared to not using the practice.

Table 3. Effect of Vispore on number of ears from Golden Hybrid Blena and Golden Jubilee, Redmond, Oregon, 1984

Variety	Vispore Cover	No. Plants	Harvest Dates			Total
			8-28	9-4	9-11	
---no. of ears---						
Golden Hybrid	Yes	30	1	13	13	27
	No	79	0	0	26	26
Golden Jubilee	Yes	28	0	0	40	40
	No	76	0	0	0	0