

# Sandea Herbicide Rotational Crop Replant Study

*K. Umeda and B. Deeter*

## **Abstract**

*Broccoli and red table beets emerged and established a stand in Sandea treated plots at 0.5 or 1.0 oz product/A. Table beets planted into the beds treated with Sandea did not exhibit significantly different rates of emergence and stand establishment relative to the untreated check. The broccoli that emerged and established a stand did not show any significant differences or numerical trends between the untreated check and the two Sandea treatments during any of the observation dates. Spinach, the third indicator crop, did not emerge adequately in the test site.*

## **Introduction**

Sandea (halosulfuron) herbicide received a Special Local Need (24C) registration for use in melons during the 2002 growing season. The primary target weed is purple nutsedge and some other broadleaved weeds. It is effective as a foliar applied herbicide and is also active in the soil. In Arizona, cantaloupe production varies with the different irrigation systems used to grow melon crops. Subsurface drip irrigation has gained significant acreage in the past ten years and furrow irrigation is still used on a majority of the state's acreage. Melon production also varies with the use of plastic mulch that is stretched across a typical 80-in raised bed and protects the ripening fruit from the soil surface and allows soil warmth to produce a very early spring crop. Concerns arose with the postemergence (POST) applications of Sandea on melons being grown on the plastic mulch. Sandea could potentially accumulate on the plastic and then "wash off" on to the soil in high amounts to affect subsequent vegetable crops. This experiment was conducted to simulate the situation of POST applications of Sandea on small cantaloupe plants and to maximize contact on the plastic mulch. Soon after Sandea applications, various vegetable crops were planted to simulate a replanting or plantback situation.

## **Materials and Methods**

A small plot field study was conducted near Wenden, AZ within a commercial cantaloupe production field. Cantaloupes were direct seeded into the soil under a plastic mulch. The cantaloupe in the seedline were spaced approximately 8-in apart where the plastic mulch was punched with a hole approximately 3-in diameter. The cantaloupe seedlines were spaced 80-in apart on individual raised beds with the plastic mulch covering approximately 36-in of the top of the bed. Subsurface drip irrigation was used to grow the cantaloupes. Sufficient moisture was available at the soil surface to germinate and establish the crop stand. At the time of Sandea herbicide postemergence applications, the soil surface under the plastic was moist. Sandea herbicide was applied in treatments at 0.5 and 1.0 oz product/A on a single bed measuring 6.7 ft wide and 20 ft long in a randomized complete block design experiment with three replicates. The treatments were applied using a backpack CO<sub>2</sub> sprayer equipped with a hand-held boom with four flat-fan 8002 nozzles spaced 20-in apart. The sprays were applied in 30 gpa water pressurized to 30 psi and a non-ionic surfactant, Latron CS-7 at 0.25% v/v was added to both treatments. At the time of the applications, the cantaloupes (cv. unknown) were at the 2 leaf stage of growth. Weeds present were ivyleaf morningglory, Palmer amaranth, common purslane, and barnyardgrass ranging in size from the cotyledon stage to the 4-leaf stage of growth. Weeds were emerging from the

same hole planted to the cantaloupe or in the furrows. At the time of applications on 25 July 2002, the sky was clear, air temperature was 88°F and there was no wind.

At 11 days after treatment on 06 Aug, the cantaloupe plants were removed by hand then the plastic mulch was removed to expose the band of moist soil. In the band, vegetable seeds were hand planted in the middle of the bed above the drip irrigation line and to either side of the middle approximately 10 in. In each replicate, broccoli, spinach, and red table beets were planted in each of the three seedlines on the moist bed (Table 1). A surface drip irrigation tape was placed on the top of the bed to adequately maintain moisture to ensure germination and emergence to establish the vegetable crops stand. At weekly intervals, the estimates of percent emergence of the crops were monitored and visual crop stand injury was observed at approximately 1 month after planting.

## **Results and Discussion**

Broccoli and red table beets emerged and established a stand while spinach did not adequately emerge evenly throughout the test site. Table beets planted into the beds treated with Sandea did not exhibit significantly different rates of emergence and stand establishment relative to the untreated check (Table 2). Some numerical differences were observed where the Sandea at 1.0 oz/A treated plot showed less emergence compared to the untreated check. However, at the 03 Sep rating date, the 1.0 oz/A treatment exhibited slightly higher percentage of emergence compared to the lower rate at 0.5 oz/A. The lower rate at 0.5 oz/A showed slightly better percentage emergence than the untreated check at the early rating dates on 13 and 19 Aug. On the 09 and 23 Sep rating dates, no significant beet injury could be observed on the established stand and the vigor of the crop was excellent. The beets had approximately 30% skip in the planted plot areas that account for the lack of a complete stand.

The broccoli that emerged and established a stand did not show any significant differences or numerical trends between the untreated check and the two Sandea treatments during any of the observation dates (Table 3). On 13 and 26 Aug, both of the Sandea treatments showed that broccoli had greater emergence compared to the untreated check. None of the broccoli treated by Sandea showed any crop injury after approximately one month when the stand was established and the crop vigor was excellent and progressing normally. Similar to the beets stand, skips occurred in the rows to account for not achieving 100% stands.

Sandea that was applied POST on the cantaloupes and would have been expected to be on the soil where the cantaloupes grew through the 3-in diameter holes and on the shoulders of the beds to the bottom of the furrow that were exposed. The remainder of the tops of the beds would not expect Sandea to contact the soil. If any of the replanted vegetable crops were to be exposed to the soil treated by Sandea, it would have been where the plastic mulch was punched to plant the cantaloupes or along the beds' shoulder where the plastic mulch was tucked under the soil. In either situation, no broccoli or red table beet injury was observed on any of the east or west side of the beds or in the middle of the bed where the cantaloupe was planted in the 3-in holes. No pattern was evident due to herbicide treatment on any of the vegetables. No rainfall occurred following the herbicide applications to "wash off" any residues of the herbicide on to the soil in the 3-in holes or on to the shoulders of the bed. Without any mechanical cultivation the beds remained virtually undisturbed following Sandea application and the replanting of the vegetables. Only soil that tucked the plastic mulch to prevent wind damage or movement of the plastic was uplifted during the removal of the plastic. It appears that the Sandea that was applied POST remained on the plastic mulch and did not move on to the soil to affect the vegetables. A minimal amount contacted the soil through the 3-in holes, however, vegetables were not affected in emergence or establishing a stand.

## **Acknowledgment**

The assistance and contribution of Mr. C. Mejia of Del Monte Corporation and Mr. M. Arbogast were valuable in providing the land, crop, and timely irrigation to conduct the experiment.

<u>Table 1.</u> Vegetable crop plantback plot design			
	Rep. 1	Rep. 2	Rep. 3
Broccoli	middle	west	east
Spinach	east	middle	west
Beets	west	east	middle

<u>Table 2.</u>	<u>Beet Emergence (%)</u>				<u>Beet Injury (%)</u>	
	13 Aug	19 Aug	26 Aug	3 Sep	9 Sep	23 Sep
Untreated	10.5 a	50.0 a	56.7 a	79.7 a	0 a	0 a
Sandea 0.5 oz product/A	16.5 a	50.3 a	48.7 a	63.3 a	0 a	3.3 a
Sandea 1.0 oz product/A	9.0 a	41.7 a	47.3 a	66.7 a	0 a	5.0 a
Means followed by the same letter do not significantly differ (P=0.05, S-N-K) Beets planted on Aug 6, 2002						

<u>Table 3.</u>	<u>Broccoli Emergence (%)</u>				<u>Broccoli Injury (%)</u>	
	13 Aug	19 Aug	26 Aug	3 Sep	9 Sep	23 Sep
Untreated	19.0 a	37.0 a	37.0 a	44.3 a	0 a	0 a
Sandea 0.5 oz product/A	26.3 a	38.3 a	39.0 a	41.0 a	0 a	0 a
Sandea 1.0 oz product/A	30.9 a	32.7 a	39.3 a	40.2 a	0 a	0 a
Means followed by the same letter do not significantly differ (P=0.05, S-N-K) Broccoli planted on Aug 6, 2002						