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2026 Grafted Watermelon Trial Updates

The 2026 watermelon research and extension program included two repeated on-farm experiments from previous years to further validate earlier findings and continue evaluating the consistency of rootstock performance under varying environmental and production conditions.

I. Grafted Mini Watermelon Trial

Grafting has been widely practiced for full-size watermelon production, but its potential application in mini watermelon production remains underexplored. With a recent increase in consumer demand for mini watermelons, we implemented a rootstock variety trial in 2025 to assess the suitability of grafting for mini watermelon production. The 2026 trial involved five citron melon rootstocks and two hybrid squash rootstocks that were grafted with the grower's commercial mini watermelon scion cultivar. Rootstock treatments were labeled and coded as RS1 through RS7 (Table 1).

Table 1. List of rootstocks used in the 2026 mini watermelon trial.

Rootstock	Type
RS1	Citron Rootstock
RS2	Citron Rootstock
RS3	Citron Rootstock
RS4	Citron Rootstock
RS5	Citron Rootstock
RS6	Hybrid Squash
RS7	Hybrid Squash

Trial Establishment and Management: The study was conducted in a commercial watermelon field near Ripon, CA (Figure 1). The seven rootstocks were grafted with the commercial watermelon cultivar 'Ocelot' while the pollenizer cultivar 'Wild Card Plus' was also grafted to minimize plant collapse and ensure pollen production. Treatments were arranged as a randomized complete block design with four replications. Each 70-foot treatment plot contained 28 grafted watermelon plants and seven grafted pollenizers. Mechanical transplanting was completed on April 7, 2026. Following transplanting, vines were manually separated several times between treatment rows throughout the season to facilitate data collection and ensure accurate harvest records. All fertilization, irrigation, and pest management followed the grower's standard practices.



Figure 1. The 2026 grafted mini watermelon trial site near Ripon, CA

Data Collection: The Normalized Difference Vegetation Index (NDVI) was measured throughout the season using a handheld crop canopy sensor to monitor canopy growth. Measurements began two weeks after transplanting and continued at regular intervals throughout the rest of the season. We conducted three harvests on July 22, August 5, and September 23, 2026, with assistance from the farm crew. The substantial interval between the second and third harvest allowed us to evaluate the plants' capacity for vine regrowth and their ability to maintain productivity over an extended period. All marketable fruits from each treatment plot were counted, weighed, and expressed on a per-acre basis. We measured fruit quality, including fruit dimension, rind thickness, sugar, and firmness in the lab using watermelons from the first harvest.

Results: Canopy cover increased steadily from May to early June across all rootstocks and remained stable until early July (Table 2). Canopies in each treatment row then declined after the first harvest (July 22) to the lowest values by the first week of August. Regrowth of vines was observed in each treatment beginning from mid-August to September 22, the day before the third harvest (Table 2). Total yield ranged from 56.6 to 68.1 tons/acre with RS5 grafted plants producing the highest yield (Table 3). Yields from treatments RS2-RS4 also exceeded 60 tons/acre. The two hybrid squash rootstocks (RS6 and RS7) had yields below 60 tons/acre (Table 3). Overall, fruit quality traits differed among rootstocks with clear differences observed in total soluble solids, rind thickness, and fruit firmness (Table 4). RS5 is the only rootstock with sugar content above 13, whereas RS6 was the only rootstock with sugar content below 12 (Table 4). In conclusion, RS5 tops in yield paired with relatively higher sugar content (13.1), moderate firmness (5.3 kg/cm2), thinner rind thickness (8.9 mm at the blossom end, 11.7 mm at the stem end), decent fruit size (7.4 inches long, 6.6 inches wide), and stable average fruit weight across harvests (6.6 lbs/fruit).

Table 2. Canopy coverage (%) for all rootstock treatments in the mini watermelon trial from April 30 to September 22, 2026

Rootstock	4/30	5/11	5/26	6/9	6/23	7/7	7/20	7/27	8/3	8/17	8/31	9/11	9/22
RS1	26	49	74	84	82	80	79	72	72	74	80	80	78
RS2	24	43	74	83	81	80	77	66	64	67	76	74	73
RS3	31	48	76	83	82	81	79	71	70	73	79	78	78
RS4	25	43	74	83	83	82	81	74	73	72	79	78	78
RS5	30	49	76	84	82	81	80	72	72	71	80	78	78
RS6	27	50	72	82	81	79	77	66	65	72	79	77	78
RS7	28	48	73	82	81	79	76	66	65	67	78	77	76

Table 3. Fruit yield at each harvest and total yields for all rootstocks in the 2026 mini watermelon trial.

	1st Harvest 7/22/26			2nd Harvest 8/5/26			3rd Harvest 9/23/26			Total	
Root stock	No/Ac.	Ton/Ac.	Avg. Weight (lb)	No/Ac.	Ton/Ac.	Avg. Weight (lb)	No/Ac.	Ton/Ac.	Avg. Weight (lb)	No/Ac.	Ton/Ac.
RS1	10724	34.8	6.4	6075	19.5	6.4	1706	4.3	4.9	18505	58.5
RS2	13808	43.9	6.3	4276	12.3	5.8	4229	10.9	5.0	22313	67.2
RS3	12173	42.0	6.9	5654	17.8	6.3	2664	6.8	4.9	20491	66.6
RS4	9182	27.1	6.0	8902	31.3	7.0	1706	3.7	4.4	19790	62.2
RS5	10584	35.3	6.7	8131	26.0	6.3	2617	6.9	5.2	21332	68.1
RS6	11075	37.4	6.7	3995	13.6	6.8	2500	6.8	5.2	17570	57.8
RS7	9883	30.1	6.1	5327	21.9	7.7	1822	4.7	5.0	17033	56.6

Table 4. Fruit quality for all rootstock treatments taken from the first harvest (July 22, 2026)

Rootstock	Length (in.)	Width (in.)	Blossom rind (mm)	Stem rind (mm)	Sugar content (°Brix)	Firmness (kg/cm²)
RS1	7.1	6.8	7.2	11.0	12.9	5.3
RS2	7.5	6.8	10.3	15.2	12.8	5.2
RS3	7.5	6.8	8.9	11.7	12.3	4.3
RS4	7.2	6.4	7.8	11.2	12.8	4.3
RS5	7.4	6.6	8.9	11.7	13.1	5.3
RS6	7.2	6.5	9.4	14.5	11.8	5.8
RS7	7.0	6.5	11.0	12.4	12.3	5.0

II. Watermelon Scion Trial 2026

While initiated in 2024, the goal of the scion variety trial is to evaluate the suitability and compatibility of different commercially available watermelon scions grafted onto commonly used watermelon rootstocks. The third-year trial in 2026 was still comprised of six scions grafted onto three widely used rootstocks (Table 5). The six scions, coded as SC1 through SC6, were selected to represent a range of horticultural characteristics, including maturity, fruit size, rind pattern, and flesh color (Table 5). A seeded variety 'Sentinel' was used as the pollenizer.

Table 5. List of scions and rootstocks used in the 2026 scion watermelon trial.

Scion	Rind Type	Description
SC1	Dark crimson stripe	Oval/blocky shaped
SC2	Crimson sweet	Blocky-shaped fruit
SC3	Crimson sweet	Round oval shaped
SC4	Crimson sweet	Uniform, large, oval-shaped
SC5	Dark mottled stripe	Blocky/oblong shaped
SC6	Mottle stripe	Round/blocky shaped
Rootstock		**Type**
Camelforce (CAM)		Interspecific hybrid Squash
Cobalt (COB)		Interspecific hybrid Squash
Carolina Strongback (CSB)		Citron Rootstock

Trial Establishment: Each treatment row was 60 feet long and contained 10 triploid watermelon plants and 3 grafted pollenizers. A total of 18 treatments were arranged in a randomized complete block design with three replications. Grafted watermelon transplants were established on May 15, 2026, in a commercial production field near Stockton, California. Vines were periodically separated between adjacent treatment rows throughout the growing season to maintain plot integrity and facilitate accurate yield assessment.

Data Collection: Canopy coverage was measured using the methodology described for the mini watermelon grafting trial. Fruit was harvested once on August 11, 2026, with assistance from the farm crew. Protocols of yield collection and quality measurements were identical to the mini watermelon trial.

Results: Canopy coverage increased rapidly from 10-17% on June 3 to approximately 67-74% by June 24 and then remained stable at approximately 77-81% until July 21 (Table 6). Canopies then underwent a small drop on August 4 followed by an accelerated vine decline after the harvest. The largest decrease was 39% for SC6 grafted onto CSB resulting from a possible infection of soil borne fungal pathogens. Samples were taken and submitted to the UC Davis Plant Fungal Diagnostic Lab for confirmation. Fruit yield ranged between 26.9 and 41.3 tons/acre across scion-rootstock combinations (Table 7). As each scion originally differs by size, yield comparisons primarily focused on the consistency of rootstock performance within each scion. Plants grafted with CSB produced the lowest yield only for SC1 and SC4 (Table 7). This was different from observations in 2024 and 2025 where CSB produced the lowest fruit yield regardless of scion. However, what was consistent from previous years was that plants grafted with CSB showed the lightest average fruit weight regardless of scion (Table 7). An average of 1.5-3 lbs lighter than the heaviest combination was recorded except for SC5 (Table 7). Fruit quality was also consistent to the 2024 and 2025 trials that yield disadvantages after grafting with CSB were traded off by the highest sugar content and softest fruit firmness (Figure 2). There were no significant differences observed regarding the fruit dimension and rind thickness.

Table 6. Canopy coverage (%) for all scion and rootstock combinations in the scion variety trial from June 3 to August 18, 2026

Scion	Rootstock	6/3	6/11	6/24	7/9	7/21	8/4	8/18
SC1	CAM	17	35	74	79	81	76	55
	COB	12	39	73	79	79	76	58
	CSB	11	30	69	80	79	75	58
SC2	CAM	16	37	73	79	79	75	47
	COB	16	34	74	78	78	73	48
	CSB	10	30	72	79	78	71	51
SC3	CAM	13	35	72	77	77	73	46
	COB	12	32	71	78	78	74	48
	CSB	13	28	72	78	77	71	54
SC4	CAM	12	35	72	78	77	74	50
	COB	11	25	71	77	78	73	52
	CSB	12	26	72	78	77	71	53
SC5	CAM	14	36	71	79	79	75	55
	COB	11	30	69	77	78	74	51
	CSB	12	28	67	77	77	72	54
SC6	CAM	10	29	71	79	79	73	48
	COB	13	28	71	79	78	71	46
	CSB	11	33	71	79	76	65	37

Table 7. Yield performance of each rootstock grafted onto the six scions for the 2026 scion variety trial.

Scion	Rootstock	No/acre	Ton/acre	Avg. fruit weight (lb)
SC1	CAM	4176	39.8	19.1
	COB	4430	40.5	18.2
	CSB	3304	27.1	16.3
SC2	CAM	4067	38.4	18.9
	COB	3849	31.2	16.1
	CSB	5737	40.1	14.0
SC3	CAM	3740	26.9	14.5
	COB	4539	36.0	15.8
	CSB	4067	29.0	14.5
SC4	CAM	4866	41.3	16.9
	COB	4248	39.3	18.5
	CSB	4503	36.4	16.2
SC5	CAM	3994	32.7	16.4
	COB	4248	38.7	18.7
	CSB	3667	33.3	18.1
SC6	CAM	3776	30.6	16.2
	COB	3994	35.4	17.7
	CSB	5192	38.0	14.5

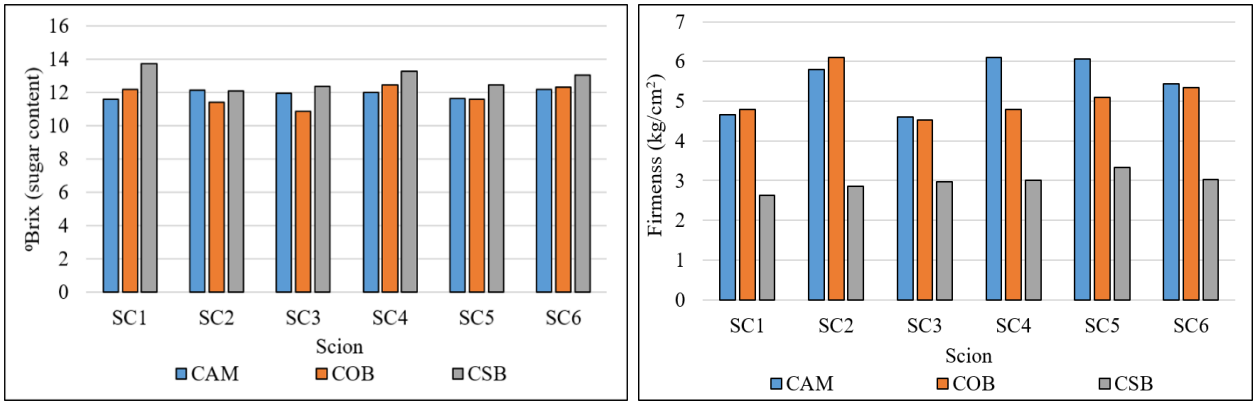

Figure 2. Comparisons of sugar content (left) and fruit firmness (right) within each scion grafted with different rootstocks.