11-2023

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Introduction

Indiana cantaloupe acreage has decreased from around 3,000 acres in the early 2000s to 1,800 acres in 2018 (USDA, 2019). The Vegetable Summary, an annual report compiled by the National Agricultural Statistics Service USDA, discontinued the inclusion of cantaloupe data for Indiana after 2018. Thus, the official information on Indiana's cantaloupe production over the past five years is no longer available. Traditionally, eastern-type cantaloupe is produced in Indiana. Longer shelf-life cultivars were developed and have been grown in Indiana. This report includes 11 cantaloupe cultivars, including some newly developed ones.

Materials and Methods

Eleven cantaloupe cultivars were evaluated in the trial. Cultivar names and seed sources are provided in Table 1.

Cantaloupe seeds were planted in 50-cell black seeding flats filled with a peat-based potting medium on 18 April, 2023. Transplants were grown in greenhouses at Southwest Purdue Agricultural Center. Seedlings were transplanted in the field on 15 May. Soils of the experimental fields are Henshaw silt loam with 1.5% organic matter. Granular fertilizers at a rate of 325 lb/acre urea (46-0-0) (150 lb/acre nitrogen), 300 lb/acre potash (0-0-60) (150 lb/acre potassium), 7 lb/acre boron 14.3% (1 lb/acre boron) and 10 lb/acre Zinc 10% LS (1 lb/acre zinc) were pre-plant broadcast applied. Plants were grown on raised beds covered with black plastic mulch. Drip tape with a 12-inch emitter spacing and a flow rate of 0.22 gpm/100 feet were used for irrigation. At transplant, each seedling received approximately one cup of starter fertilizer solution using Brandt Plant Start 8-27-2 at a rate of 4 quarts per acre.

A completely randomized design with three replications was used for the experiment. The experimental plot was comprised of one 40-ft bed with 16 cantaloupe plants on 2.5 ft in-row spacing. The beds were spaced on 6 ft centers (Figure 1).

Insecticide Admire Pro® was applied in transplant water to control cucumber beetles, and Permethrin® and Sevin® XLR were sprayed after transplanting. Fungicides Initiate® 720, Aprovia Top®, Inspire Super®, Presidio®, Ranman®, Rally®, Miravis® Prime, Rampart® were rotationally sprayed to control foliar diseases.

Harvests were conducted three times a week for four weeks from 14 Jul. to 4 Aug. Fruit were weighed individually and separated as marketable and culls. Three fruit of each variety per replication were collected for fruit quality measurement. Fruit size, seed cavity size, total soluble solids, and flesh firmness were recorded. Soluble solids contents (SSC%) were measured with a digital refractometer. Flesh firmness was measured using a force gauge (FT 011) with 8 mm diameter tip.

Analysis of variance was performed using JMP Pro 16. Fisher's least significant difference test ($\alpha = 0.05$) was conducted for multiple comparisons of different measurements among watermelon cultivars.

Results and Discussion

The environmental conditions in general were good for melon production in 2023 (Figure 2). Marketable yields of the cultivars ranged from 49,253 to 23,251 lbs/acre (Table 2). The top-yielding cultivars were Damaris, Astound, Aphrodite; the yields were not significantly different from MS0685, HMC458995, HighMark #18700, Accolade, and MS0680. Aphrodite and HMC458995 had the largest fruit; they were not significantly different from Damaris, HighMark C103 and HMC454080 (Table 5). Cultivar MS0680, HighMark #501, HMC454080, and MS0685 had the highest sugar content; and cultivar Damaris, HMC458995, and MS0685 had the highest values in flesh firmness.

Cantaloupe was harvested when fruit developed abscission zones and changed color. Some of the evaluated cultivars maintained green and had less pronounced abscission zones when ripening, which requires the harvest crews to have specific training in order to harvest the fruit at the right stage. Cultivar HMC454080 and MS0685 had the most fruit harvested in the third week (Figure 3), and with a higher percentage of culls (Table 2), indicating some of the fruit should have been harvested earlier. HighMark C103 had the highest yield in the first week of harvest, followed by Aphrodite, Astound and Accolade (Figure 3). However, HighMark C103 had a high percentage of cull fruit, even in the early harvest. The high rate of unmarketable fruit could attribute to leaf necrosis toward the end of the season. Manganese toxicity due to low soil pH was confirmed at the trial (Guan and Egel, 2017). The symptom showed in clusters in the field, the most heavily affected area had soil pH at 4.6, and leaf manganese (Mn) content above 1000 ppm. By the end of the season, HighMark C103 was the most affected cultivar in the trial (Table 4).

References

Guan W. and D. Egel. 2017. Manganese toxicity on cantaloupes. Vegetable Crops Hotline Issue 631. Nov. 17,2023 < https://vegcropshotline.org/article/manganese-toxicity-on-cantaloupes/>

USDA, 2019. National Agricultural Statistics Service. Vegetables 2018 Summary.

Acknowledgments

Seed companies Syngenta, Harris Moran and HighMark provided financial support for the trial. Brandt Consolidated, Inc. donated the Plant Start fertilizer.

Southwest Purdue Agricultural Center employees Dean Haseman, Barbara Joyner, Angie Thompson, Bill Davis; graduate student Emerson Luna; and SWPAC summer helpers provided technical assistance for the trial. Dr. Dan Egel, Purdue Extension plant pathologist, provided suggestions for fungicide application and reviewed this report; Alex Helms, assistant director of Purdue Agricultural Centers, took the drone picture.

Table 1. Cultivar names and seed sources of cantaloupes evaluated at the Southwest Purdue Agricultural Center in Vincennes, IN in 2023.

Cultivar	**Company**
MS0680	Syngenta
MS0685	Syngenta
Damaris	Syngenta
Astound	Syngenta
Accolade	Syngenta
Aphrodite	SWPAC_Syngenta
HMC458995	Harris Moran
HMC454080	Harris Moran
HighMark #18700	HighMark
HighMark C103	HighMark
HighMark #50	HighMark

Table 2. Yields and average fruit weight of cantaloupes evaluated at the Southwest Purdue Agricultural Center in Vincennes, IN in 2023.

Cultivar	**Marketable yield**				**Total Yield**				**Cull (%)**
	Weight (lbs) per acre		**Fruit count per acre**		**Weight (lbs) per acre**		**Fruit count per acre**		
Damaris	49253	a[z]	9136	a	54184	a	10164	a	9.10
Astound	47205	a	9136	a	50508	ab	10104	a	6.54
Aphrodite	46525	ab	7865	ab	49756	ab	8652	a	6.50
MS0685	43214	abc	8652	a	48703	ab	9922	a	11.27
HMC458995	42109	abc	7260	ab	46918	abc	8168	ab	10.25
HighMark #18700	40176	abc	7805	ab	41793	abc	8228	ab	3.87
Accolade	38148	a-d	7442	ab	40845	abc	8228	ab	6.60
MS0680	37872	a-d	8168	ab	39446	abc	8531	a	3.99
HighMark C103	30499	bcd	5506	bc	37960	abc	7563	ab	19.65
HighMark #501	30037	cd	8773	a	32916	bc	9680	a	8.75
HMC454080	23251	d	4175	c	29752	c	5385	b	21.85

[z] Means within a column followed by the same letter do not differ significantly at $P < .05$

Table 3. Marketable yields (lbs/acre) at each harvest week of cantaloupes evaluated at the Southwest Purdue Agricultural Center in Vincennes, IN in 2023.

Cultivar	**Week 1**		**Week 2**		**Week 3**		**Week 4**	
Damaris	287	d[z]	14675	a	23278	abc	11013	b
Astound	3649	c	12766	a	21121	abc	9669	b
Aphrodite	7497	b	14665	a	16484	a-d	7878	b
MS0685	0	d	6221	cd	29675	a	7318	bc
HMC458995	0	d	2922	de	19148	abc	20039	a
HighMark #18700	299	d	6702	cd	21543	abc	11632	b
Accolade	2865	cd	11547	ab	16444	a-d	7292	bc
MS0680	507	d	1895	e	25805	ab	9666	b
HighMark C103	17896	a	7173	c	4150	d	1280	c
HighMark #501	603	d	8826	bc	11730	cd	8879	b
HMC454080	0	d	370	e	13858	bcd	9023	b

[z] Means within a column followed by the same letter do not differ significantly at $P < .05$

Table 4. Percentage of canopies showing necrosis of cantaloupes evaluated at the Southwest Purdue Agricultural Center in Vincennes, IN in 2023. The data was collected on 24 July, 2023.

Cultivar	Percentage of canopy showing necrosis	
HighMark C103	53	a[z]
HMC454080	35	ab
Astound	30	abc
Accolade	20	bc
MS0680	18	bc
MS0685	16	bc
Aphrodite	10	bc
HighMark #18700	10	bc
Damaris	8	bc
HMC458995	5	c
HighMark #501	5	c

[z] Means within a column followed by the same letter do not differ significantly at $P < .05$

Table 5. Average fruit weight, fruit size, seed cavity size, firmness and total soluble solids of cantaloupe varieties evaluated at the Southwest Purdue Agricultural Center in Vincennes, IN in 2023.

Variety	**Average fruit wt. (lb)**		**Length (cm)**		**Width (cm)**		**Seed cavity length (cm)**		**Seed cavity width (cm)**		**Firmness (lbs-force)**		**Soluble solids content (°Brix)**	
MS0680	4.63	d[z]	17.51	e	15.44	d	11.18	c	6.24	ef	3.85	bc	11.57	a
MS0685	4.97	cd	17.61	e	15.68	cd	11.18	c	7.08	cd	4.38	ab	11.16	ab
Damaris	5.35	abc	19.30	a-d	16.83	b	11.41	c	6.58	def	5.09	a	10.01	cde
Astound	5.17	bcd	18.52	b-e	16.67	b	11.81	bc	6.16	f	2.93	de	9.44	ef
Accolade	5.16	bcd	18.17	cde	16.42	bc	11.49	c	6.87	cde	2.64	de	10.26	cd
Aphrodite	5.94	a	17.81	de	17.97	a	12.19	abc	9.02	a	2.23	e	10.68	bc
HMC458995	5.77	a	19.80	ab	16.84	b	13.49	a	7.39	bc	4.46	ab	9.91	c-f
HMC454080	5.62	ab	20.07	a	17.13	b	13.18	ab	5.39	g	3.29	cd	11.17	ab
HighMark #18700	5.16	bcd	19.37	abc	16.82	b	13.19	ab	7.81	b	2.90	de	9.19	f
HighMark C103	5.55	abc	19.34	abc	17.02	b	11.71	c	6.26	ef	NA		9.83	def
HighMark #501	3.41	e	17.21	e	13.56	e	11.34	c	6.39	ef	3.07	cd	11.30	ab

[z] Means within a column followed by the same letter do not differ significantly at $P < .05$

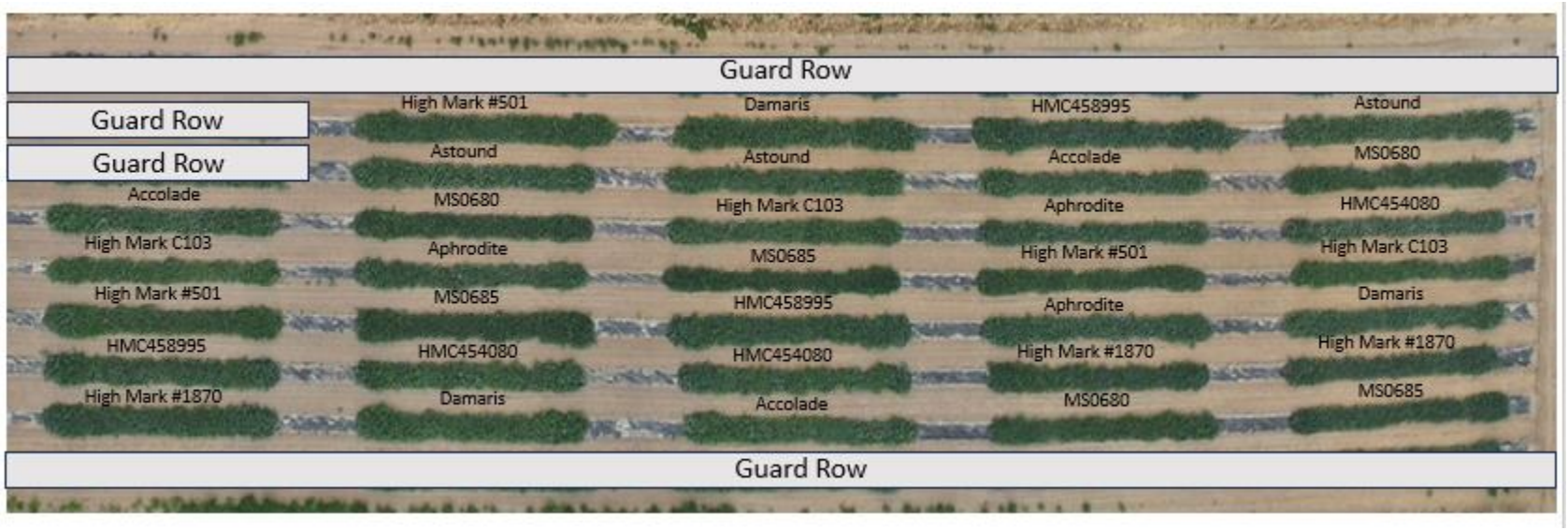


Figure 1. Overview of the cantaloupes in the 2023 cantaloupe cultivar trial at Southwest Purdue Agricultural Center in Vincennes, IN. The picture was taken on June 28 by Alex Helms.

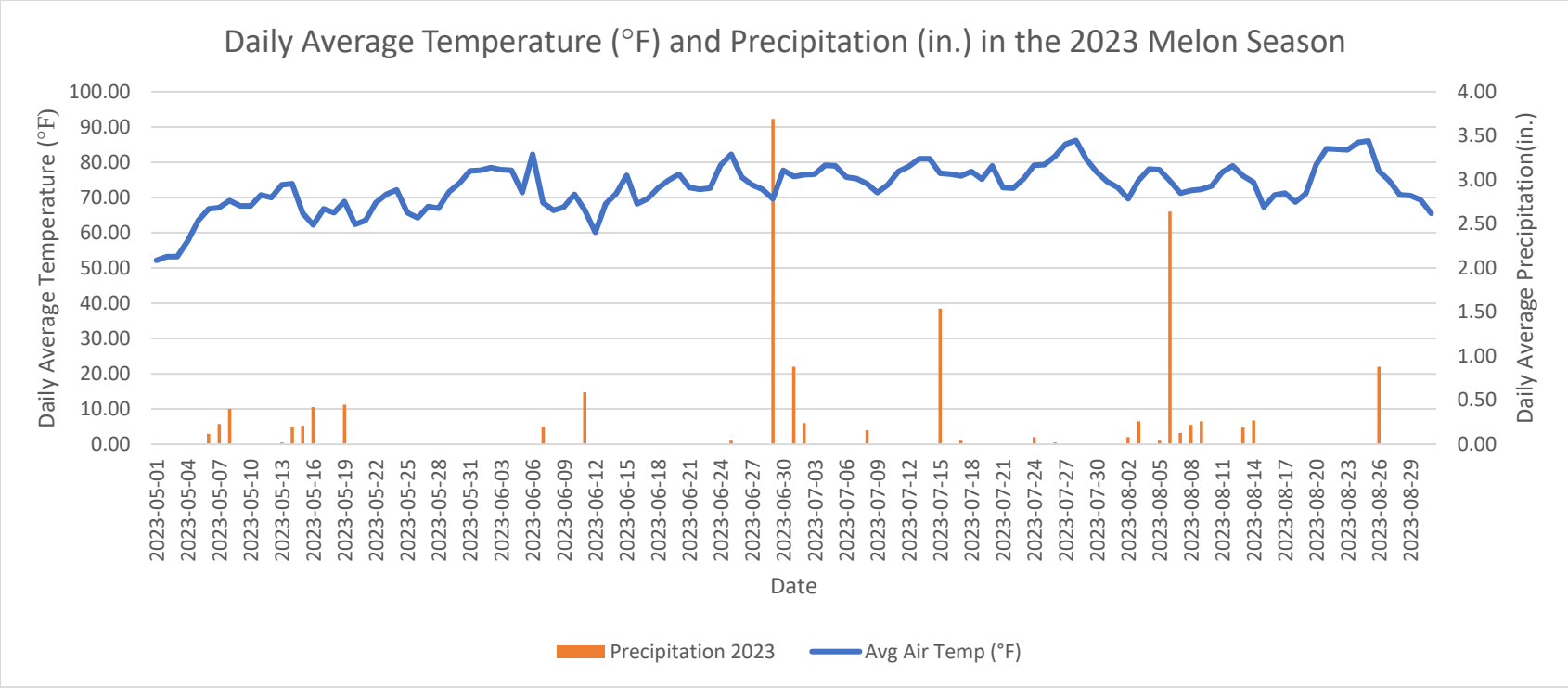


Figure 2. Daily precipitation (in.) recorded at Southwest Purdue Ag Center (SWPAC) from May to August in 2023. Data was adapted from Purdue Mesonet Data Hub at Indiana State Climate Office (https://ag.purdue.edu/indiana-state-climate/).

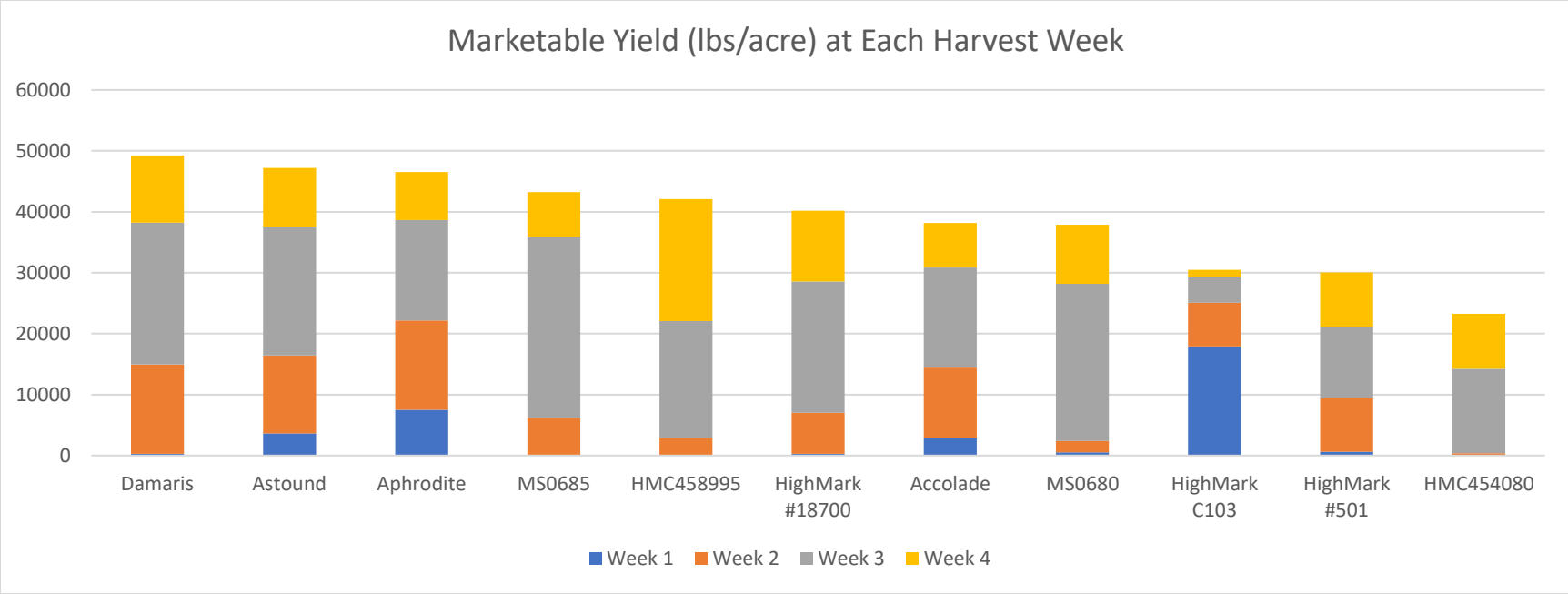
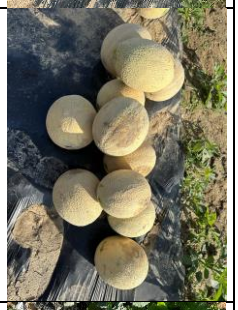
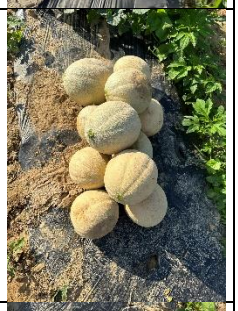
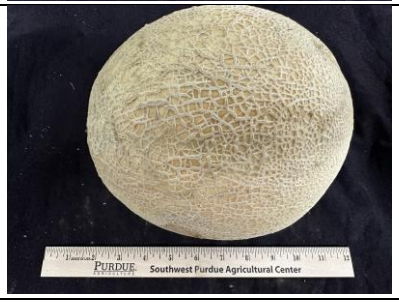
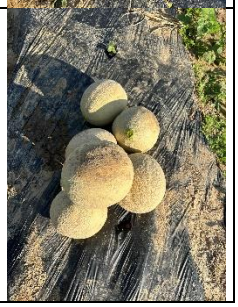
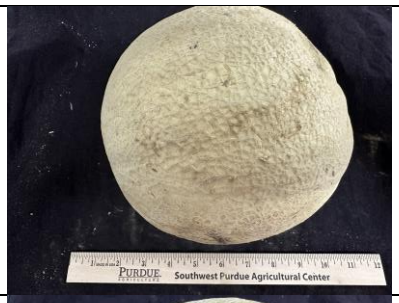
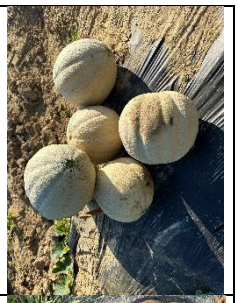
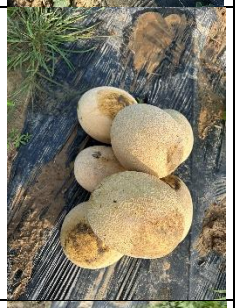
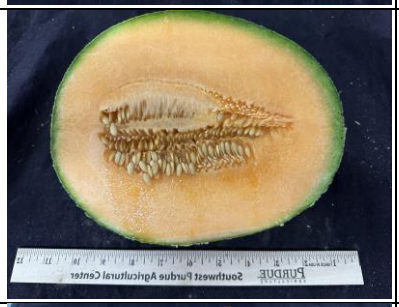
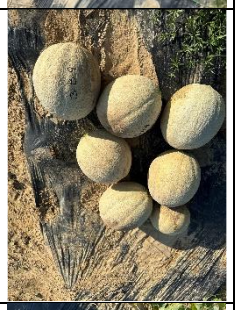
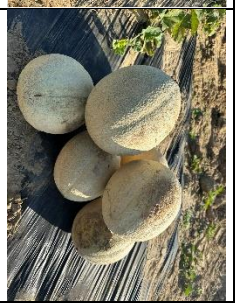


Figure 3. Marketable yield (lbs/acre) at each harvest week of cantaloupes in the 2023 cantaloupe cultivar trial at Southwest Purdue Agricultural Center in Vincennes, IN.

Figure 4. Manganese toxicity symptoms were observed at the trial.

MS0680			
MS0685			
Damaris			
Astound			
Accolade			

Aphrodite			
HMC458995			
HMC454080			
HighMark #18700			
HighMark C103			

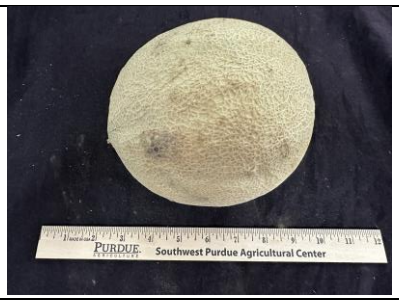
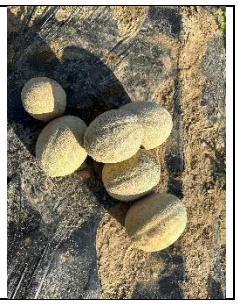
HighMark #501			

Figure 5. Exterior and interior of cantaloupe cultivars in the 2023 cantaloupe trial.