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Wenjing Guan

Purdue University, guan40@purdue.edu

Dan Egel

Purdue University - Main Campus, egel@purdue.edu

Dennis Nowaskie

Southwest Purdue Agriculture Center, nowaskie@purdue.edu

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Watermelon Variety Evaluations in Southwest Indiana, 2016

Wenjing Guan, Daniel S. Egel and Dennis Nowaskie, Southwest Purdue Agricultural Center, Vincennes, IN, 47591

Indiana is one of the major watermelon production areas in the U.S. In 2015, watermelon production in Indiana ranked sixth in harvested area (6,900 acres) and total production (2,415,000 cwt) following Florida, Texas, Georgia, California and South Carolina (USDA, 2016). The majority of watermelons grown in Indiana are triploid watermelons, with a small portion of the acreages growing diploid watermelons (seeded watermelon) and personal-size triploid watermelons. Variety selection based on yield, disease resistance and fruit quality is one of the key decisions in watermelon production. The objective of this study is to provide watermelon producers in Indiana with regional and updated information on triploid, personal-size triploid and diploid watermelon varieties.

Materials and Methods

Three watermelon variety trials were conducted in 2016 in Vincennes, Indiana. The triploid watermelon variety trial included 44 watermelon varieties and two grafted varieties; the personal-size triploid watermelon variety trial included four varieties; the diploid watermelon variety trial included five varieties. Seed sources are provided in Table 2. ‘SP-6’ was used as the pollinizer for the triploid watermelons.

All the seeds were planted in 50-cell black seeding flats (T.O. Plastics, Clearwater, MN) filled with a peat-based potting media (Metro-Mix 360, a mixture of sphagnum peat moss, coarse perlite, bark ash, starter fertilizer and dolomite). Transplants were grown in greenhouses at the Southwest Purdue Agricultural Center (SWPAC). Seedling dates and transplanting dates are provided in Table 3.

Soil type of the field is Ade loamy fine sand. Soybean was previously grown in the field in 2015. Plants were grown in raised beds covered with black plastic mulch. Drip tape with a 12-inch emitter spacing and flow rate of 0.22 gpm/100 feet were used for irrigation. Fertilizers at the rate of 250 lb/acre urea (46-0-0), 150 lb/acre potash (0-0-60), 100 lb/acre diammonium phosphate (18-46-0), 200 lb/acre dolomite lime, 100 lb/acre K-Mag granular, 7 lb/acre boron 14.3% and 20 lb/acre Zinc 10% LS were broadcast applied prior to laying black plastic mulch. During transplanting, each plant received approximately one cup of starter fertilizer solution (Miracle-Gro, 4.7 grams per gallon water). Pests were managed using recommendations from Melcast (melcast.info) and the *Midwest Vegetable Production Guide for Commercial Growers* (Egel et al., 2016).

Randomized complete block designs with three replications were used in the trials. Experimental plots of the triploid watermelons and diploid watermelons were comprised of 48-ft bed that was spaced on 8 ft centers. Each experimental plot included 12 watermelon plants on 4 ft in-row spacing. Pollenizers were interplanted between every two triploid plants in the same row. The experimental plot of personal-size watermelons was comprised of three 8-ft rows spaced on 6 ft

centers. Plants were planted 2 ft apart for a total of 12 plants per plot. Pollenizers were planted in one row of every three rows of personal-size triploid watermelons.

Harvests were conducted once a week for four weeks on the three trials. Triploid watermelons were harvested from 21 July to 11 Aug. Personal-size triploid watermelons were harvested from 27 July to 18 Aug. Diploid watermelons were harvested from 18 July to 8 Aug. Fruit were weighted individually. Nine fruit of each variety were collected during peak harvest for fruit quality measurements. Fruit size and rind thickness were recorded. Total soluble solids were measured with a digital refractometer. Flesh firmness was measured using a force gauge with 11mm diameter tip. Hollow heart severity was evaluated using a 1-5 scale: 1. none; 2. carpel separation evident; 3. one large gap evident; 4. more than 2 large gaps; 5. severe. Seedlessness was evaluated by counting black hard seeds on cutting surfaces of quartered melons. If there were 10 or more back seeds, the fruit was rated as unacceptable.

Analysis of variance was performed using the Proc Mixed procedure of SAS. Fisher's least significant difference test ($\alpha = 0.05$) was conducted for multiple comparisons of different measurements among watermelon varieties.

Greenhouse *Fusarium wilt* test

In September of 2016, seeds of the 42 varieties of the field trial plus 3 varieties used for comparison purposes were planted in 6-inch pots in a greenhouse at SWPAC. Each pot was an experimental unit with 3 seedlings and was replicated 3 times. When seedlings had reached the first true leaf stage, 100 ml of the inoculum of *Fusarium oxysporum* f.sp. *niveum* (1×10^7 conidia) were poured into each pot. The Horsfall-Barratt rating scale was used to rate the seedlings 4 times throughout September. The Area Under the Disease Progress Curve (AUDPC) was calculated from these rating using trapezoid integration.

Results and Discussions

Weather condition

During 2016 production season, we had a dry and hot June. Mean temperature in June was 4 °F higher than 30 years' average. August was particularly wet with precipitation more than double of the 30 years' average, which might negatively affect the yield. The temperature in May was cooler than normal, soil temperature did not reach 70 °F until around May 25.

Triploid watermelons

The yields of triploid watermelon varieties ranged from 18,729 to 56,212 lb/acre (Table 4). The top yielding variety was 'Premont', which was also the top yielding variety in the 2015 triploid watermelon variety trial. In addition to 'Premont', marketable yields of grafted 'Fascination', and 'Excursion' were also above 50,000 lb/acre. 12 varieties (Wayfarer, Distinction, Crunchy Red, Traveler, Exclamation, UGR 1763, Wolverine, Embassy, Warrior, KB 12106, Grafted 7197 and Talca) yielded between 50,000 to 45,000 lb/acre. Some of them were first evaluated in the 2016 variety trial. But it is worth noting that 'Traveler', 'KB 12106' and 'Exclamation' were also among the top yielding varieties in the 2015 variety trial.

The fourth highest yielding variety Wayfarer produced the most marketable fruit (3,857) that were mainly in the 60-count category. 'Premont' had the second most marketable fruit (3,705)

mainly in the 45-count category. ‘Excursion’ ranked second in market yield, but ranked 24th in marketable fruit number since it mainly produced 36-count fruit. Among the varieties that had the yield above 45,000 lb/acre, ‘Traveler’ and ‘Wayfarer’ had most 60-count fruit while others had primarily 45-count fruit (Table 5).

In the first harvest (66 days after transplant), ‘Excursion’ had higher yield than other varieties. ‘Razorback’, ‘Sweet Dawn’, ‘Warrior’, ‘KB12106’ also had numerically higher yields in the first harvest. No fruit of ‘ORS12.154A’, ‘3F-2186’ and ‘ORS6064b’ was harvested on 21 July, ‘ORS6227’, ‘3F-4139’ also had low yields on the first harvest date (Table 6 and Figure 1).

Total soluble solids (TSS) ranged from 12.91 to 9.92 °Brix. ‘Poseidon’ had the highest TSS. It was also one of the sweetest varieties in the 2015 variety trial. Varieties ‘3F-2186’, ‘Road Trip’, ‘Sweet Dawn’, ‘Joy Ride’, ‘Summer Breeze’, ‘3F-4221’, ‘UGR 1763-14’, ‘HSR 4638’ and ‘Secretariat’, ‘Chubbiness’, ‘HSR4631’ also had TSS above 12 °Brix. Grafted ‘7197’ and ‘Maxima’ had firmer flesh compared with other varieties (Table 7). Ratings of hollow heart severity were generally low in the trial. Of the evaluated nine fruit per variety, 20 of 46 varieties did not have any fruit showing hollow heart symptoms. Most of the fruit did not have black seeds or had just a few. However, ‘Fascination’, ‘Joy Ride’, ‘Road Trip’, ‘Embassy’, ‘Kingman’, ‘Chubbiness’, ‘ORS12.154a’, and grafted ‘Fascination’ had one or two fruit among evaluated nine fruit that had more than 10 black seeds (data not shown).

This is the first year that we included grafted watermelons (variety Fascination and 7197) in the variety trial. Both of the grafted varieties yielded higher than their non-grafted counterparts although no significant differences in yields were identified. Interestingly, grafted 7197 had significantly higher values on flesh firmness than non-grafted 7197 (Table 7), which confirmed the previous observation that grafting might increase watermelon flesh firmness in some varieties.

In the greenhouse Fusarium wilt test, symptoms of Fusarium wilt were first observed 8 days post-inoculation. Isolations were made from selected plants upon termination of the experiment to confirm the wilt symptoms observed were caused by *F. oxysporum* f.sp. *niveum*. The triploid varieties KB 12106, Fascination, Sweet Dawn, ORS12.154a, and Distinction had significantly less wilt than 17 triploids. Razorback, Embassy and Crunchy Red had significantly more wilt than 16 triploids (Table 8). The low amount of wilt in the open pollinated variety Calhoun Gray may indicate that the strain of *F. oxysporum* f.sp. *niveum* used was race 1.

Personal-size triploid watermelons

The yields of personal-size triploid watermelons are presented in Table 9. Significant yield differences were observed among the four varieties. Variety Extazy had the highest yield (70,334 lb/acre), followed by Krimson Kiss (68,914 lb/acre), Serval (45,368 lb/acre) and Ocelot (32,595 lb/acre). Variety Ocelot had less fruit compared with other varieties. Average fruit weight of ‘Extazy’ was similar to ‘Krimson Kiss’, which were significantly larger than average fruit weights of ‘Ocelot’ and ‘Serval’.

Percentages of fruit in different fruit weight categories are illustrated in Figure 2. Personal-size watermelons range in size from 4 to 9 lb. ‘Extazy’ and ‘Krimson Kiss’ had 18.6% and 34.3%

fruit larger than 10 lb, respectively, which may not be marketable as personal-size watermelons. ‘Ocelot’ and ‘Serval’ had 77.8% and 83.9% of fruit ranged in size from 4 to 8 lb, respectively.

Variety ‘Krimson Kiss’ had a significant higher TSS value compared with other varieties, while ‘Extazy’ and ‘Serval’ had the lowest value on TSS (Table 10). ‘Extazy’ and ‘Serval’ had thicker rind compared with ‘Krimson Kiss’ and ‘Ocelot’. The thicker rind can be an advantageous character for shipping, but it also means there is less edible flesh. Differences in fruit length and width among varieties followed the similar trend as average fruit weight. Flesh firmness was similar among varieties at $\alpha = 0.05$ level. Of the evaluated nine fruit per variety, ‘Extazy’ had 1 fruit and ‘Ocelot’ had 2 fruit that had more than 10 black seeds (data not shown). No hollow-heart fruit was observed.

Diploid watermelons

Marketable yield of the five diploid watermelons ranged from 37,723 to 44,849 lb per acre (Table 11). No significant differences in marketable weights were observed among varieties. ‘Royal Sweet’ had the highest marketable yield on the first harvest date (18 July), which accounted for about 50% of the yield in the season (Table 12). ‘Regency’, ‘Santa Matilde’, ‘Sentinel’ and ‘SW8443WL’ had similar yields on 25 July that were higher than ‘Royal Sweet’. No significant differences in marketable yields were observed in the third and fourth harvest among the varieties.

Average fruit weights of ‘Santa Matilde’ and ‘SV8443WL’ were significantly higher than those of ‘Regency’ and ‘Sentinel’. About 50% of ‘Santa Matilde’ fruit were more than 23 lb. Fruit less than 23 lb accounted for 83% and 95% of ‘Sentinel’ and ‘Regency’, respectively. Fruit sizes of ‘Royal Sweet’ ranged from less than 15 lb to more than 27 lb (Table 11, Figure 3).

No significant differences in total soluble solids were observed among varieties. ‘SV8443WL’ had firmer flesh compared with ‘Sentinel’, ‘Regency’ and ‘Royal Sweet’. Fruit length varied among varieties, but fruit widths were similar regardless of fruit sizes (Table 13). No hollow heart fruit was observed in the selected fruit of each variety.

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Table 1. Precipitation; maximal, minimal and average temperatures of 30 years' average and 2016 in Vincennes, IN (data were adapted from Indiana State Climate Office and SWPAC record).

Month	Precipitation <i>inch</i>		Max temperature $^{\circ}F$		Min temperature $^{\circ}F$		Mean temperature $^{\circ}F$	
	<i>Average</i>	<i>2016</i>	<i>Average</i>	<i>2016</i>	<i>Average</i>	<i>2016</i>	<i>Average</i>	<i>2016</i>
May	5.93	4.89	76	75	54	54	65	63
June	4.19	3.10	84	90	63	67	74	78
July	4.64	4.78	88	87	66	69	77	77
August	3.41	8.98	87	90	64	69	76	78

Table 2. Varieties and seed sources of triploid watermelon, personal-size triploid watermelon and diploid watermelon varieties in the 2016 watermelon variety trials in southwest Indiana.

Watermelon variety	Seed Source
<i>Triploid watermelon varieties</i>	
7167	Nunhems
7197	Nunhems
3F-2186	Known You
3F-4139	Known You
3F-4221	Known You
Captivation	Syngenta
Charismatic	Sakata
Chubbiness	Known You
Crunchy Red	Harris Moran
Cut Above	Clifton
Distinction	SWPAC stock
Embassy	Nunhems
Exclamation	Syngenta
Excursion-WDL2413	Syngenta
Fascination	Syngenta
G 7197 ^z	Tri-Hishtil
G Fascination ^z	Tri-Hishtil
HSR4638	Hollar
HSR4631	Hollar
Joy Ride	Seminis
KB 12106	K&B
KB 15010 (spotted type)	K&B
Kingman	Sakata
Maxima	Origene
Neptune	Seedway
ORS12.154a	Origene
ORS6064b	Origene
ORS6227	Origene
Poseidon	Seedway
Premont	Clifton
Prime	Known You
Razorback	Highmark
Road Trip	Seminis
Secretariat	Sakata
Sugar Fresh	Syngenta
Summer Breeze	Seminis
Sweet Dawn	Syngenta
Talca	Origene
Traveler	Harris Moran
UGR 1762-14	United Genetics
UGR 1763-14	United Genetics

Watermelon variety	Seed Source
Unbridled	Sakata
USAW 90020	US Agriseeds
Warrior	Nunhems
Wayfarer	Harris Moran
Wolverine	Highmark
<i>Personal-size triploid watermelon varieties</i>	
Extazy	Hazera Genetics
Krimson Kiss	Clifton Seed
Ocelot	Hazera Genetics
Serval	Hazera Genetics
<i>Diploid watermelon varieties</i>	
Regency	Seminis
Royal Sweet	SWPAC
Santa Matilde	Seminis
Sentinel	Seminis
SV8443WL	Seminis

^z G_7197: Grafted 7197; G_Fascination: Grafted Fascination.

Table 3. Seedling and transplanting dates of triploid watermelons, personal-size triploid watermelons, diploid watermelons, and pollinizers in the 2016 watermelon variety trials in southwest Indiana.

Watermelon varieties	Seedling Dates	Transplanting Dates
Triploid watermelon varieties	14 April	16 May
Personal size triploid watermelon varieties	18 April	23 May
Diploid watermelon varieties	15 April	18 May
Pollenizer	12 April	16 May and 23 May

Table 4. Marketable yields and average fruit weights of triploid watermelons in the 2016 watermelon variety trial in southwest Indiana.

Tripliod watermelon variety	Weight		Number of fruit per acre		Average fruit weigh	
	lb/A				lb	
7167	36,468	cdefgh ^z	2,685	cdefgjij	13.52	ijklmn
7197	42,001	abcdefg	2,798	bcdefgh	15.06	bcdefgh
3F-2186	31,972	efghij	2,722	bcdefgjij	11.72	pqr
3F-4139	31,852	efghij	2,949	abcdef	10.73	qrs
3F-4221	36,887	bcdefgh	3,063	abcdef	11.82	pqr
Captivation	44,877	abcdef	2,987	abcdef	14.98	bcdefghi
Charismatic	36,232	cdefgh	2,533	defghij	14.31	defghijlm
Chubbiness	30,261	fghij	2,798	bcdefgh	10.86	qrs
Crunchy Red	48,392	abcd	3,327	abcde	14.46	defghijkl
Cut Above	44,645	abcdef	3,290	abcde	13.65	ghijklmn
Distinction	48,841	abcd	3,025	abcdef	16.21	ab
Embassy	47,347	abcde	3,252	abcde	14.58	defghijkl
Exclamation	47,852	abcd	2,911	abcdef	16.27	ab
Excursion-WDL2413	50,391	abc	2,836	bcdefg	17.71	a
Fascination	43,644	abcdefg	2,836	bcdefg	15.40	bcde
G_7197 ^y	45,953	abcde	3,063	abcdef	14.90	bcdefghij
G_Fascination ^y	52,429	ab	3,252	abcde	16.15	bc
HSR4638	40,212	bcdefg	2,685	cdefghij	15.06	bcdefgh
HSR4631	36,714	cdefgh	2,647	defghij	13.72	ghijklmn
Joy Ride	36,217	cdefgh	2,458	defghij	14.19	defghijklmn
KB 12106	46,094	abcde	3,063	abcdef	15.07	bcdefg
KB 15010	41,712	abcdefg	3,176	abcde	13.11	lmnop
Kingman	43,322	abcdefg	2,836	bcdefg	15.25	bcdef
Maxima	29,957	fghij	1,815	hij	16.48	ab
Neptune	40,282	bcdefg	2,949	abcdef	13.71	ghijklmn
ORS12.154a	19,792	ij	1,891	ghij	10.36	rs
ORS6064b	18,729	j	1,777	ij	10.17	s
ORS6227	34,424	defghi	2,571	defghij	13.39	jklmno
Poseidon	40,969	abcdefg	3,214	abcde	12.68	nop
Premont	56,212	a	3,706	ab	15.13	bcdefg
Prime	32,057	efghij	2,685	cdefghij	11.92	opq
Razorback	39,294	bcdefg	2,836	bcdefg	13.99	efghijklmn
Road Trip	34,418	defghi	2,420	efghij	14.17	efghijklmn
Secretariat	38,051	bcdefgh	2,911	abcdef	13.08	lmnop
Sugar Fresh	42,343	abcdefg	2,798	bcdefgh	15.12	bcdefg
Summer Breeze	28,366	ghij	2,080	fghij	13.59	hijklmn
Sweet Dawn	27,242	hij	1,739	j	15.70	bcd
Talca	45,548	abcde	2,798	bcdefgh	16.25	ab
Traveler	48,383	abcd	3,668	abc	13.20	klmnop
UGR 1762-14	35,911	defgh	2,647	defghij	13.53	ijklmn
UGR 1763-14	47,618	abcd	3,441	abcd	13.84	fghijklmn
Unbridled	38,315	bcdefg	2,647	defghij	14.51	defghijkl
USAW 90020	37,774	bcdefgh	2,760	bcdefghi	13.77	fghijklmn
Warrior	47,219	abcde	3,214	abcde	14.67	cdefghijk
Wayfarer	49,614	abc	3,857	a	12.86	mno
Wolverine	47,430	abcd	3,252	abcde	14.65	cdefghijk

^zMeans within a column followed by the same letter are not significantly different according to Fisher's least significant difference test at $P \leq 0.05$.

^yG_7197: Grafted 7197; G_Fascination: Grafted Fascination.

Table 5. Percentages of triploid watermelons in fruit weight categories in the 2016 watermelon variety trial in southwest Indiana.

Triploid watermelon variety	< 9 lb	9-13.5 lb 60 count	13.6-17.5 lb 45 count	17.6-21.4 lb 36 count	>21.5 lb 30 count
7167	12.7 ^y	38.1	39.4	8.4	1.4
7197	2.7	25.7	52.7	16.2	2.7
3F-2186	16.7	51.4	29.2	2.8	0
3F-4139	30.3	53.9	15.8	0	0
3F-4221	17.3	49.4	30.9	2.5	0
Captivation	8.9	26.6	39.2	20.2	5.1
Charismatic	6.0	37.3	38.8	14.9	3.0
Chubbiness	21.6	62.2	16.2	0	0
Crunchy Red	6.9	32.2	44.8	13.8	2.3
Cut Above	9.3	37.0	43.0	10.5	0
Distinction	1.2	26.2	43.7	16.2	12.5
Embassy	3.4	39.1	43.7	10.3	3.4
Exclamation	0	25	43.2	22.4	9.2
Excursion-WDL2413	6.1	12.1	24.2	37.9	19.7
Fascination	2.7	29.3	36.0	26.7	5.3
G_7197 ^z	5.0	29.6	35.8	25.9	3.7
G_Fascination ^z	8.1	16.3	33.7	32.5	9.3
HSR4638	5.6	22.5	50.7	21.1	0
HSR4631	7.1	37.1	42.9	12.9	0
Joy Ride	9.2	30.8	30.8	24.6	4.6
KB 12106	2.5	22.2	61.7	12.3	1.2
KB 15010 (spotted type)	7.1	50.0	33.3	9.5	0
Kingman	4.0	24.0	44.0	24.0	4.0
Maxima	2.3	20.4	38.6	25.0	13.6
Neptune	2.6	39.7	44.8	12.8	0
ORS12.154a	31.4	56.9	11.8	0	0
ORS6064b	27.9	63.8	8.5	0	0
ORS6227	13.2	41.2	35.3	7.3	2.9
Poseidon	9.4	49.4	40.0	1.2	0
Premont	4.1	21.4	55.1	16.3	3.1
Prime	16.9	54.9	26.8	1.4	0
Razorback	8.0	34.7	45.3	12.0	0
Road Trip	9.4	28.1	46.9	14.1	1.5
Secretariat	16.9	33.8	41.5	6.5	1.3
Sugar Fresh	4.3	30.4	40.6	21.7	2.9
Summer Breeze	9.1	36.3	47.2	7.3	0
Sweet Dawn	0	23.7	44.7	28.9	2.6
Talca	0	28.4	33.8	27.0	10.8
Traveler	10.3	44.3	36.1	9.3	0
UGR 1762-14	6.0	44.8	38.8	10.4	0
UGR 1763-14	3.3	37.4	54.9	4.4	0
Unbridled	10.0	31.4	34.3	21.4	2.8
USAW 90020	2.7	47.9	39.7	9.6	0
Warrior	5.9	28.2	50.6	14.1	1.2
Wayfarer	14.5	42.7	36.9	4.8	1.0
Wolverine	4.6	26.7	54.6	11.6	2.3

^zG_7197: Grafted 7197; G_Fascination: Grafted Fascination.^yStatistical analyses were not included.

Table 6. Marketable yields of triploid watermelons in the first (66 days after transplanting, DAT) harvest in the 2016 watermelon variety trial in southwest Indiana.

Triploid watermelon variety	Weight <i>lb/A</i>	Number of fruit per acre
7167	4,077 ^y	265
7197	5,708	378
3F-2186	0	0
3F-4139	886	113
3F-4221	1,064	75
Captivation	1,464	75
Charismatic	2,784	189
Chubbiness	3,989	340
Crunchy Red	3,154	227
Cut Above	2,656	189
Distinction	3,759	265
Embassy	2,421	151
Exclamation	5,909	340
Excursion-WDL2413	11,437	605
Fascination	5,090	302
G 7197 ^z	3,811	227
G Fascination ^z	1,652	113
HSR4638	2,228	151
HSR4631	1,309	76
Joy Ride	5,453	302
KB 12106	7,185	454
KB 15010 (spotted type)	6,187	454
Kingman	2,896	189
Maxima	1,367	76
Neptune	1,741	113
ORS12.154a	0	0
ORS6064b	0	0
ORS6227	501	38
Poseidon	4,187	302
Premont	4,136	265
Prime	4,835	340
Razorback	7,459	529
Road Trip	6,185	378
Secretariat	5,079	378
Sugar Fresh	1,139	76
Summer Breeze	5,782	378
Sweet Dawn	7,423	454
Talca	1,824	113
Traveler	1,490	113
UGR 1762-14	2,307	151
UGR 1763-14	5,549	378
Unbridled	2,812	189
USAW 90020	2,914	189
Warrior	7,243	454
Wayfarer	5,108	415
Wolverine	2,415	151

^zG_7197: Grafted 7197; G_Fascination: Grafted Fascination.^yStatistical analyses were not included.

Table 7. Fruit quality of triploid watermelon varieties in the 2016 watermelon variety trial in southwest Indiana.

Triploid watermelon variety	Total soluble solids		Firmness		Rind thickness		Fruit length		Fruit width		Hollow heart ^z	
	°Brix		lbs-force		in		in		in			
7167	11.49	defghijk ^y	2.50	defgh	0.73	bcd	11.32	bcdefg	8.92	efghijklm	1	d
7197	11.39	efghijkl	2.65	bcdefgh	0.73	bcd	10.99	defghijk	8.93	efghijklm	1.11	cd
3F-2186	12.77	ab	2.31	fgh	0.69	bcd	11.21	bcdefghi	8.48	mnp	1.33	bc
3F-4139	11.33	efghijkl	2.34	efgh	0.65	cd	9.04	p	8.58	lmnop	1	d
3F-4221	12.22	abcdef	2.83	abcdefg	1.00	a	9.24	op	8.79	ghijklm	1	d
Captivation	11.18	fghijkl	2.53	cdefgh	0.70	bcd	11.35	bcdefg	9.31	bcdefg	1.89	a
Charismatic	11.96	abcdefghi	2.37	efgh	0.78	abcd	10.59	fghijklm	9.37	bcdef	1	d
Chubbiness	12.09	abcdefgh	2.35	efgh	0.61	cd	10.00	lmno	8.18	nop	1	d
Crunchy Red	11.22	fghijkl	3.08	abcde	0.70	bcd	11.97	abc	8.92	efghijklm	1	d
Cut Above	11.62	cdefghij	2.37	efgh	0.69	bcd	11.14	cdefghij	9.22	bcdefghij	1.11	cd
Distinction	10.72	klm	2.90	abcdef	0.75	bcd	10.58	fghijklm	9.97	a	1.22	bcd
Embassy	11.32	efghijkl	2.91	abcdef	0.66	bcd	10.84	defghijkl	8.77	hijklm	1.33	bc
Exclamation	11.23	fghijkl	2.70	bcdefgh	0.76	bcd	10.67	efghijklm	9.44	abcde	1.11	cd
Excursion-WDL2413	10.67	klm	2.64	bcdefgh	0.65	cd	12.00	abc	9.39	bcde	1.11	cd
Fascination	10.96	ijklm	2.60	bcdefgh	0.71	bcd	11.37	bcdefg	9.21	bcdefghij	1.33	bc
G 7197 ^x	11.40	efghijkl	3.43	a	0.78	abcd	11.40	bcdef	8.81	ghijklm	1	d
G Fascination ^x	11.29	efghijkl	3.13	abcd	0.71	bcd	12.06	ab	9.26	bcdefgh	1.11	cd
HSR4638	12.12	abcdefgh	2.31	fgh	0.73	bcd	10.33	ijklmn	9.70	ab	1.11	cd
HSR4631	12.11	abcdefgh	2.23	fgh	0.68	bcd	9.83	mnp	9.29	bcdefgh	1.11	cd
Joy Ride	12.62	abc	2.85	abcdefg	0.66	bcd	10.99	defghijk	8.86	fghijklm	1.11	cd
KB 12106	11.64	cdefghij	3.20	abc	0.64	cd	11.12	cdefghij	8.69	klm	1	d
KB 15010	10.38	klm	2.48	defgh	0.70	bcd	10.75	defghijk	8.50	mnp	1.4	b
Kingman	11.42	efghijkl	2.49	defgh	0.78	abcd	11.27	bcdefgh	9.09	defghijkl	1	d
Maxima	10.96	ijklm	3.47	a	0.70	bcd	10.05	lmno	9.65	abc	1	d
Neptune	11.14	fghijklm	2.53	cdefgh	0.69	bcd	10.36	ijklmn	9.20	bcdefghij	1	d
ORS12.154a	10.32	lm	2.85	abcdefg	0.69	bcd	10.51	ghijklmn	8.08	p	1	d
ORS6064b	9.92	m	3.12	abcde	0.67	bcd	9.95	lmnop	8.10	op	1	d
ORS6227	10.58	klm	2.36	efgh	0.81	abc	12.49	a	8.78	ghijklm	1	d
Poseidon	12.91	a	2.38	efgh	0.80	abc	10.95	defghijk	8.81	ghijklm	1.11	cd
Premont	11.22	fghijkl	3.27	ab	0.72	bcd	11.21	bcdefghi	9.24	bcdefghi	1	d

Triploid watermelon variety	Total soluble solids °Brix		Firmness lbs-force		Rind thickness in		Fruit length in		Fruit width in		Hollow heart ^z	
Prime	11.64	cdefghij	2.01	h	0.68	bcd	10.41	hijklmn	8.63	lmno	1.22	bcd
Razorback	11.97	abcdefghi	2.83	abcdefg	0.73	bcd	10.07	lmno	9.06	defghijkl	1	d
Road Trip	12.68	abc	2.43	efgh	0.69	bcd	11.31	bcdefg	8.78	hijklm	1	d
Secretariat	12.03	abcdefghi	2.65	bcdefgh	0.77	bcd	10.87	defghijkl	8.95	defghijklm	1	d
Sugar Fresh	11.16	fghijklm	2.66	bcdefgh	0.75	bcd	11.52	bcde	9.20	bcdefghij	1.22	bcd
Summer Breeze	12.39	abcde	2.89	abcdef	0.62	cd	10.59	fghijkl	9.47	abcd	1	d
Sweet Dawn	12.60	abcd	2.24	fgh	0.57	d	11.56	bcd	9.18	bcdefghij	1	d
Talca	10.61	jklm	2.46	defgh	0.87	ab	11.36	bcdefg	9.22	bcdefghij	1	d
Traveler	11.03	hijklm	2.88	abcdef	0.65	cd	10.27	jklmn	8.92	efghijklm	1	d
UGR 1762-14	11.97	abcdefghi	2.51	cdefgh	0.62	cd	10.65	efghijklm	8.79	ghijklm	1.22	bcd
UGR 1763-14	12.16	bcdefg	2.61	bcdefh	0.73	bcd	11.50	bcde	8.73	ijklm	1	d
Unbridled	11.06	ghijklm	2.22	fgh	0.83	abc	10.16	klmn	9.21	bcdefghij	1	d
USAW 90020	10.81	jklm	2.17	gh	0.73	bcd	11.06	defghij	9.13	cdefghijk	1.17	bcd
Warrior	10.79	jklm	2.82	abcdefg	0.69	bcd	11.13	cdefghij	8.92	efghijklm	1.22	bcd
Wayfarer	11.67	bcdefghij	3.24	ab	0.73	bcd	9.65	nop	9.01	defghijklm	1	d
Wolverine	11.48	efghijk	3.10	abcde	0.75	bcd	10.13	klmn	9.22	bcdefghij	1.17	bcd

^zHollow heart severity was evaluated using a 1-5 scale: 1. None; 2. Carpel separation evident; 3. One large gap evident; 4. More than 2 large gaps; 5. severe.

^yMeans within a column followed by the same letter are not significantly different according to Fisher's least significant difference test at $P \leq 0.05$.

^xG_7197: Grafted 7197; G_Fascination: Grafted Fascination

Table 8. Severity of Fusarium wilt of 42 seedless varieties as determined in a greenhouse trial conducted at the Southwest Purdue Agriculture Center in September 2016.

Triploid watermelon variety^z	AUDPC	Rank out of 45
7167	128.80 bcdefghijk ^x	19
7197	163.51 bcdefgh	14
3F-2186	204.61 bcd	4
3F-4139	189.26 bcdef	6
3F-4221	179.77 bcdef	10
Black Diamond ^y	46.98 jklm	39
Calhoun Gray ^y	13.95 lm	44
Captivation	77.60 fghijklm	35
Charismatic	115.99 bcdefghijklm	21
Charleston Gray ^y	78.07 efghijklm	34
Chubbiness	59.26 ghijklm	36
Crunchy Red	212.17 abc	3
Cut Above	55.32 hijklm	37
Distinction	31.94 klm	40
Embassy	224.23 ab	2
Exclamation	170.51 bcdefg	12
Excursion	49.56 ijklm	38
Fascination	18.37 klm	43
HSR4631	78.40 efghijklm	33
HSR4638	184.99 bcdef	8
Joy Ride	129.46 bcdefghijk	18
KB 12106	3.57 m	45
KB 15010	105.04 cdefghijklm	24
Kingman	92.41 defghijklm	29
Maxima	161.67 bcdefghi	15
Neptune	122.96 bcdefghijkl	20
ORS12.154a	30.04 klm	41
ORS6064b	164.11 bcdefgh	13
ORS6227	91.17 efghijklm	31
Poseidon	187.51 bcdef	7
Premont	100.93 cdefghijklm	25
Prime	184.93 bcdef	9
Razorback	324.53 a	1
Road Trip	170.85 bcdefg	11
Secretariat	95.56 defghijklm	27
Sugar Fresh	190.91 bcde	5
Summer Breeze	150.55 bcdefghij	17
Sweet Dawn	23.78 klm	42
Talca	91.64 defghijklm	30
Traveler	89.89 efghijklm	32
Unbridled	153.85 bcdefghij	16
USAW 90020	93.72 defghijklm	28
Warrior	100.30 cdefghijklm	26
Wayfarer	106.39 cdefghijklm	23
Wolverine	109.00 cdefghijklm	22

^zVarieties UGR-1762-14, UGR-1763-14 and the grafted 7197 and Fascination are not included in the Fusarium wilt trial.

^yBlack Diamond, Charleston Gray and Calhoun Gray are open pollinated varieties included for comparison purposes.

^xMeans within a column followed by the same letter are not significantly different according to Fisher's least significant difference test at $P \leq 0.05$.

Table 9. Marketable yields and average fruit weights of personal-size triploid watermelons in the 2016 watermelon variety trial in southwest Indiana.

Personal-size triploid watermelon Variety	Weight		Number of fruit		Average fruit weight	
	<i>lb/A</i>		per acre		<i>lb</i>	
Extazy	70,334	a ^z	8,224	a	8.5	a
Krimson Kiss	68,914	b	7,430	a	9.38	a
Ocelot	32,595	d	4,594	b	7.16	b
Serval	45,368	c	7,033	a	6.44	b

^zMeans within a column followed by the same letter are not significantly different according to Fisher's least significant difference test at $P \leq 0.05$.

Table 10. Fruit quality of personal-size triploid watermelons in the 2016 watermelon variety trial in southwest Indiana.

Personal-size triploid watermelon Variety	Total soluble solids		Firmness		Rind thickness		Length		Width	
	^o Brix		<i>lbs-force</i>		<i>in</i>		<i>in</i>		<i>in</i>	
Extazy	10.63	c ^z	3.82	a	0.65	a	8.20	a	7.72	a
Krimson Kiss	12.43	a	3.02	a	0.55	b	8.33	a	7.48	a
Ocelot	11.04	b	4.01	a	0.54	b	7.69	b	6.87	b
Serval	10.46	c	4.35	a	0.66	a	7.21	c	6.93	b

^zMeans within a column followed by the same letter are not significantly different according to Fisher's least significant difference test at $P \leq 0.05$.

Table 11. Marketable yields and average fruit weights of diploid watermelons in the 2016 watermelon variety trial in southwest Indiana.

Diploid watermelon variety	Weight		Number of fruit per		Average fruit weight	
	<i>lb/A</i>		acre		<i>lb</i>	
Regency	44,849	a	2,420	a ^z	18.47	c
Royal Sweet	42,476	a	2,080	ab	20.37	bc
Santa Matilde	37,783	a	1,588	b	23.76	a
Sentinel	40,611	a	2080	ab	19.47	c
SV8443WL	37,723	a	1,739	b	21.88	ab

^zMeans within a column followed by the same letter are not significantly different according to Fisher's least significant difference test at $P \leq 0.05$.

Table 12. Marketable yields of diploid watermelons on each harvest date in the 2016 watermelon variety trial in southwest Indiana.

Diploid watermelon variety	July 18		July 25		August 1		August 8									
	Weight (lb) per acre	Number of fruit per acre	Weight (lb) per acre	Number of fruit per acre	Weight (lb) per acre	Number of fruit per acre	Weight (lb) per acre	Number of fruit per acre								
Regency	9,332	b ^z	454	b	25,168	a	1,361	a	7,931	a	453	a	2418	a	151	a
Royal Sweet	21,140	a	907	a	13,992	b	794	b	2,371	a	113	a	4974	a	265	a
Santa Matilde	12,402	b	529	b	19,982	ab	832	b	2,678	a	113	a	2721	a	113	a
Sentinel	9,517	b	491	b	22,480	a	1,097	ab	5,616	a	302	a	2998	a	189	a
SV8443WL	12,662	b	529	b	18,812	ab	870	b	2,901	a	151	a	3348	a	189	a

^zMeans within a column followed by the same letter are not significantly different according to Fisher's least significant difference test at $P \leq 0.05$.

Table 13. Fruit quality of diploid watermelons in the 2016 watermelon variety trial in southwest Indiana.

Variety	Total soluble solids °Brix		Firmness lbs-force		Rind in		Fruit length in		Fruit width in	
Regency	11.54	a	2.03	b ^z	0.64	a	13.09	bc	8.73	a
Royal Sweet	11.48	a	2.04	b	0.72	a	12.82	c	8.86	a
Santa Matilde	11.38	a	2.38	ab	0.66	a	14.48	a	9.02	a
Sentinel	11.74	a	2.03	b	0.67	a	13.61	abc	9.01	a
SV8443WL	11.58	a	2.72	a	0.71	a	13.94	ab	9.01	a

^zMeans within a column followed by the same letter are not significantly different according to Fisher's least significant difference test at $P \leq 0.05$.

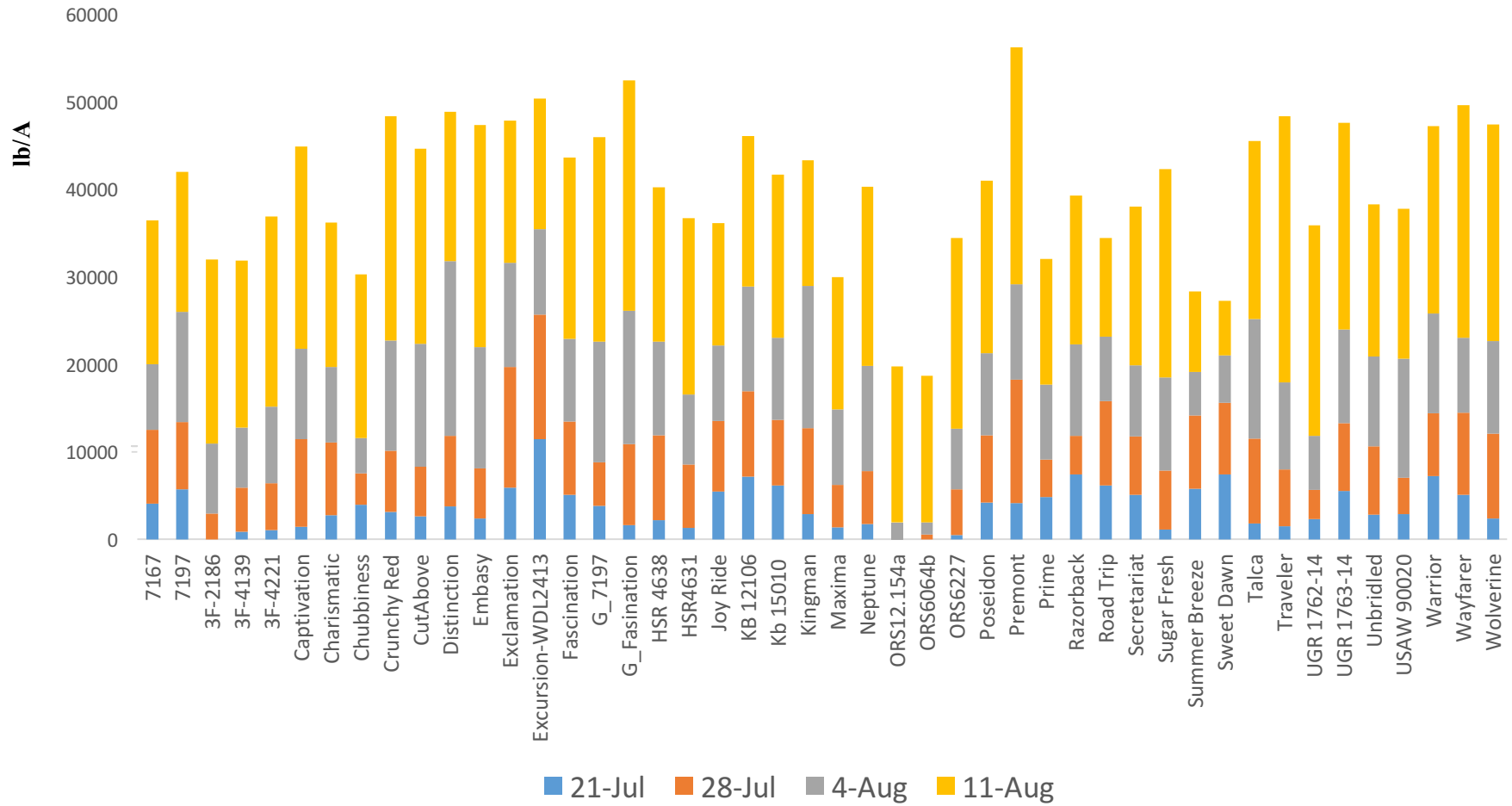


Figure 1. Yield of triploid watermelon varieties on each harvest date in the 2016 watermelon variety trial in southwest Indiana.

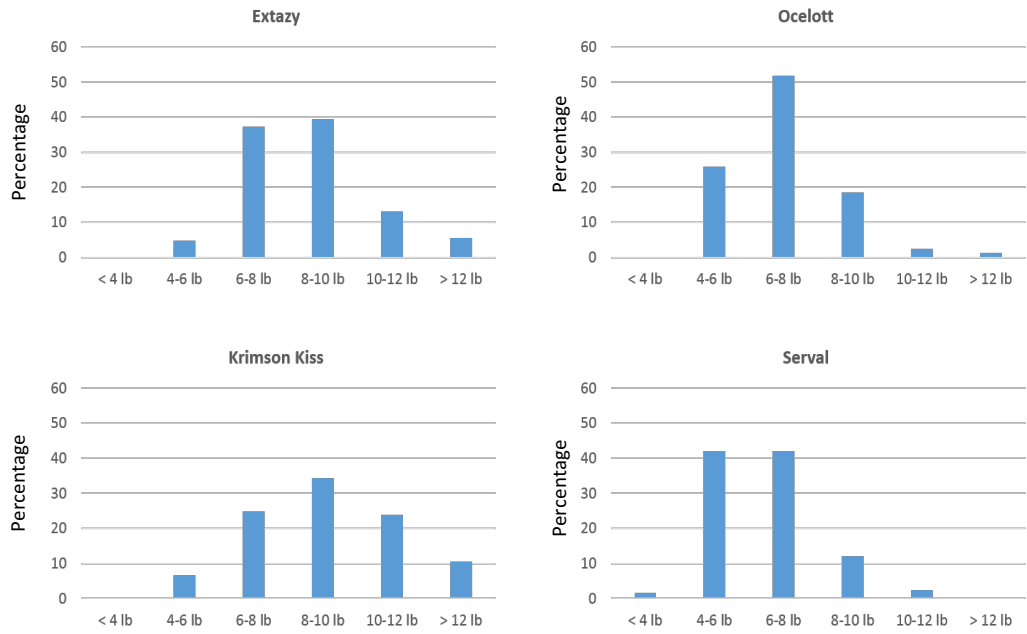


Figure 2. Percentage of personal-size triploid watermelons in each weight category in the 2016 watermelon variety trial in southwest Indiana.

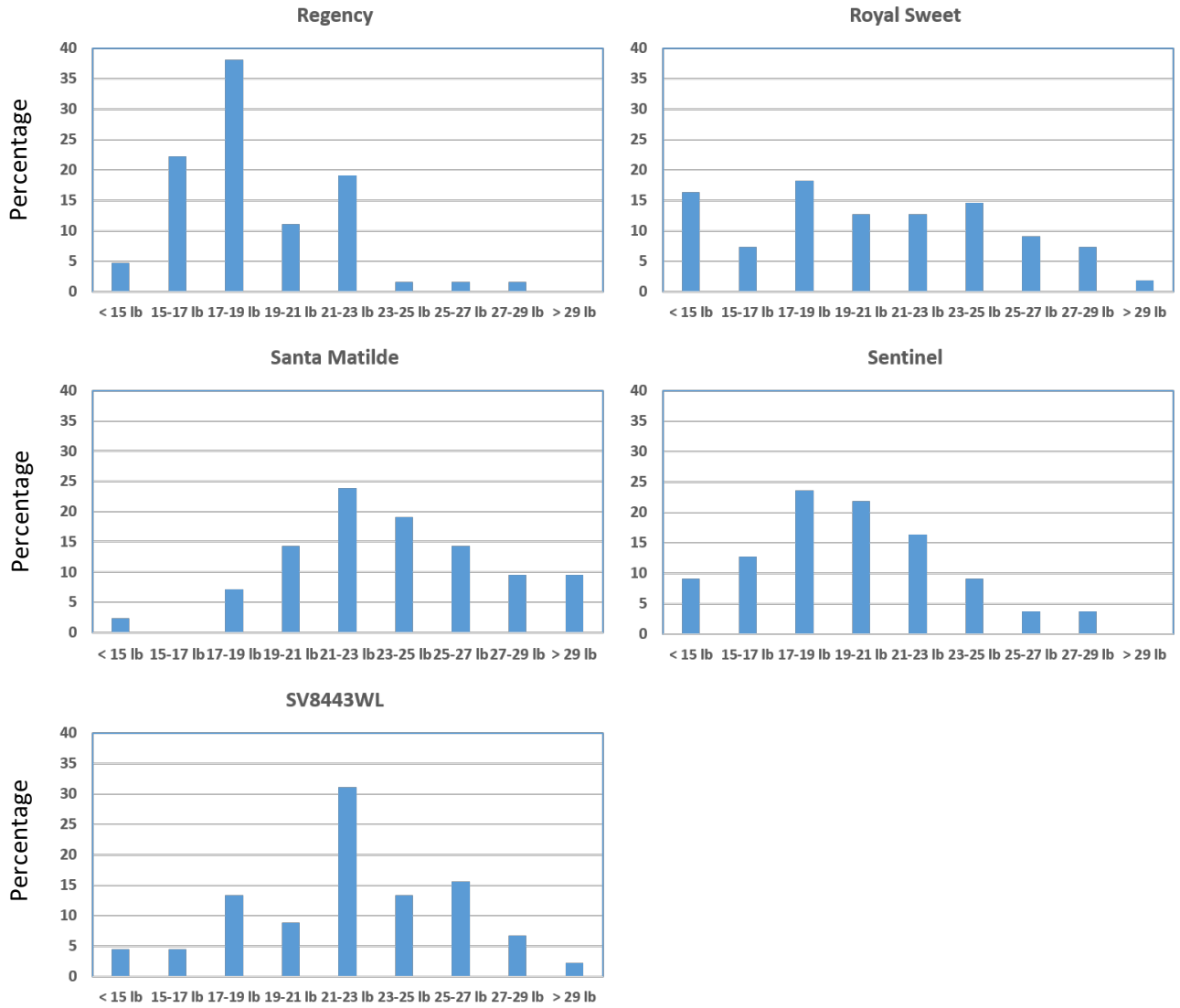


Figure 3. Percentage of diploid watermelons in each weight category in the 2016 watermelon variety trial in southwest Indiana.



Figure 4. Exterior and interior of triploid watermelon varieties in the 2016 personal-size triploid watermelon variety trial in southwest Indiana. **1.** 7167; **2.** 7197; **3.** 3F-2186; **4.** 3F-4139; **5.** 3F-4221; **6.** Captivation; **7.** Charismatic; **8.** Chubbiness; **9.** Crunchy Red; **10.** Cut Above; **11.** Distinction; **12.** Embassy; **13.** Exclamation; **14.** Excursion-WDL2413; **15.** Fascination; **16.** G_7197; **17.** G_Fascination; **18.** HSR 4638; **19.** HSR 4631; **20.** Joy Ride; **21.** KB 12106; **22.** Kb 15010 (spotted type); **23.** Kingman; **24.** Maxima; **25.** Neptune; **26.** ORS12.154a; **27.** ORS6064b; **28.** ORS6227; **29.** Poseidon; **30.** Premont; **31.** Prime; **32.** Razorback; **33.** Road Trip; **34.** Secretariat; **35.** Sugar Fresh; **36.** Summer Breeze; **37.** Sweet Dawn; **38.** Talca; **39.** Traveler; **40.** UGR 1762-14; **41.** UGR 1763-14; **42.** Unbridled; **43.** USAW 90020; **44.** Warrior; **45.** Wayfarer; **46.** Wolverine.

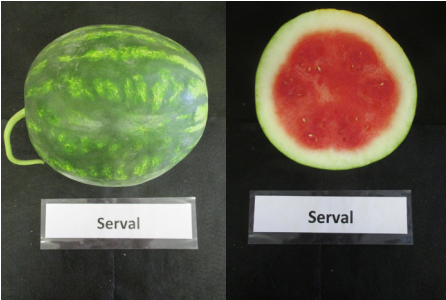
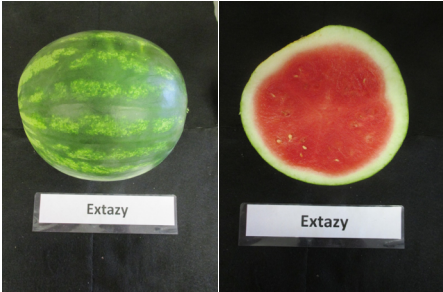


Figure 5. Exterior and interior of personal-size triploid watermelon varieties in the 2016 watermelon variety trial in southwest Indiana.



Figure 6. Exterior and interior of diploid watermelon varieties in the 2016 watermelon variety trial in southwest Indiana.