Watermelon Variety Trials 2021

Gordon C. Johnson, PhD
Extension Fruit and Vegetable Specialist
Department of Plant and Soil Sciences
University of Delaware

UNIVERSITY OF DELAWARE

UNIVERSITY OF DELAWARE
COOPERATIVE EXTENSION

Selecting Varieties

- Yield
- Maturity
- Longevity
- Size Distribution
- Appearance
  - Rind color
  - Shape
- Quality
  - Soluble solids (sugar)
- Flesh density
- Limited defects
  - Hollow heart
- Plant vigor
- Disease resistance
  - Fusarium
  - Anthracnose

https://www.udel.edu/canr/cooperative-extension/sustainable-production/commercial-crops/vegetable-crops/variety-trials/

UNIVERSITY OF DELAWARE | Cooperative Extension

COLLEGE OF AGRICULTURE & NATURAL RESOURCES

Seedless Watermelon Variety Trial Results 2020

2019 Variety Trial Information

- 37 Varieties
- 8 Companies
- 4 Replications
- UD REC
- 9 plant plots, SP7 pollenizer

- Planted May 18
- Harvested 3 times
- Individual weights
- Soluble solids
- Hard Seed
- Hollow Heart

Varieties Syngenta

Large seedless – Commercial Varieties

Fascination

Captivation

Excursion

Large seedless – New product line varieties

Summerlicous (WDL6421)

Powerhouse (WDL7401)

Large seedless - Experimental varieties

WDL8415

WDL9450

WDL9454

Dark rind varieties

Sweet Gem – commercial

Dark Knight – new variety

Firm flesh

Scarlet Crisp - Commercial

WDL8425 – Experimental

Mini -Seedless

Sirius

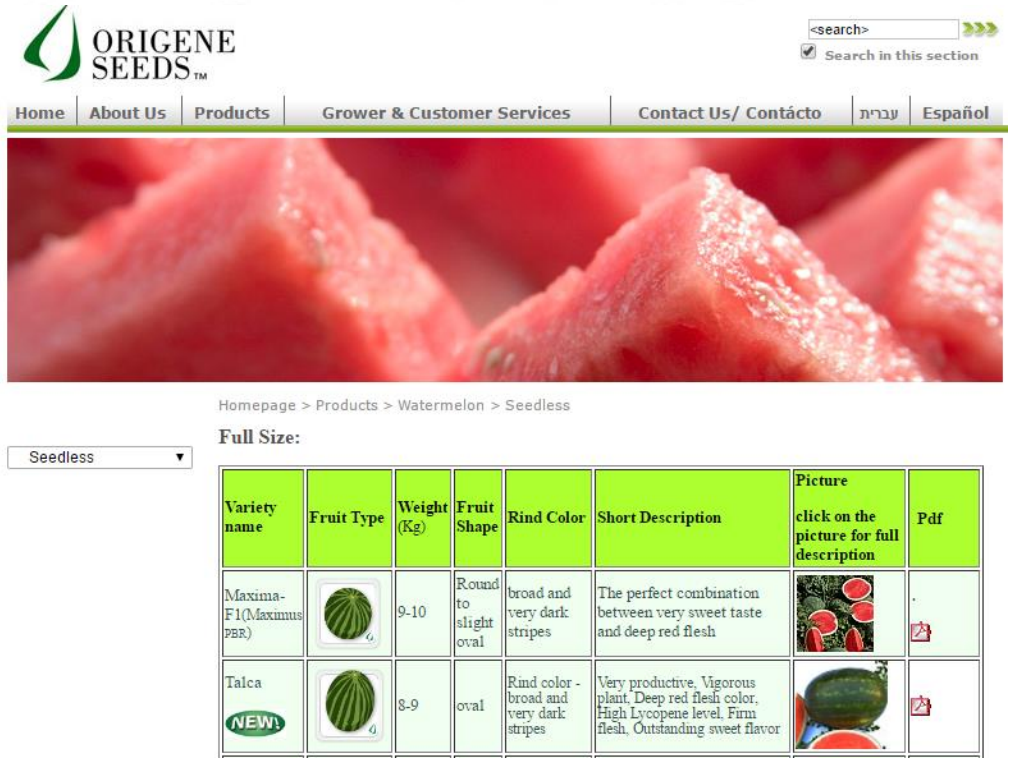
Petite Perfection

Varieties Seminis

- Bottle Rocket
- Joy Ride*
- Shoreline
- Tailgate
- SVWA 6576

Varieties Origene

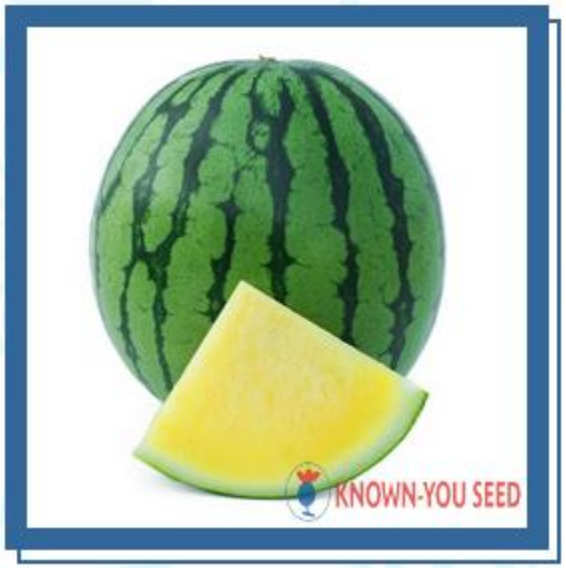
- Essence
- ORS 6132C
- ORS 7220 mini
- ORS 70314 mini
- ORS 70368 mini



Varieties Sakata

- Kingman*
- El Capitan
- Sierra Nevada
- FWT 9161

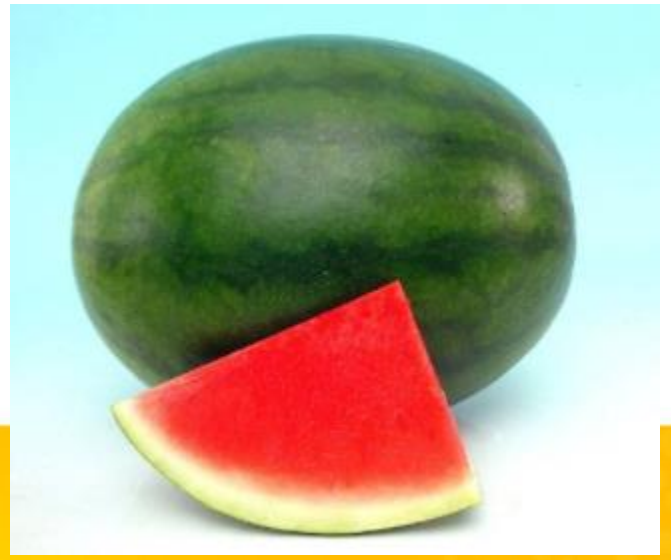
Varieties – Known You



Orchid Sweet

Our yellow-fleshed seedless watermelon is widely adaptive and sets fruits easily. Fruits are medium in size, globe shaped, and weighing 4 kg approximately. Rind is light green with dark green stripes. Flesh is bright yellow, juicy, crispy and sweet.

- Orchid Sweet - yellow seedless
- 3F-2186 - standard red seedless
- Prime - specialty



Varieties – Enza Zaden, Hazera, HmClause

- Enza Zaden
  - **Red Amber***
  - E26C00124
  - E26C00139

- HMClause
  - Crunchy Red

- Hazera
  - Nectaro mini

Variety	Lbs/a	
El Capitan	112954	a
Crunchy Red	100216	ab
E26C00124	96689	ab
Scarlet Crisp	93686	abc
Fascination	93140	abcd
Tailgate	89593	abcde
Red Amber	89559	abcde
Captivation	86754	bcdef
Sierra Nevada	86102	bcdefg
Excursion	84621	bcdefg
Dark Knight	84456	bcdefg
ORS 6132C	83459	bcdefg
Kingman	82175	bcdefgh
WDL 9450	82001	bcdefgh

2021 Top Group Standard Seedless


EL CAPITAN


SIERRA
NEVADA

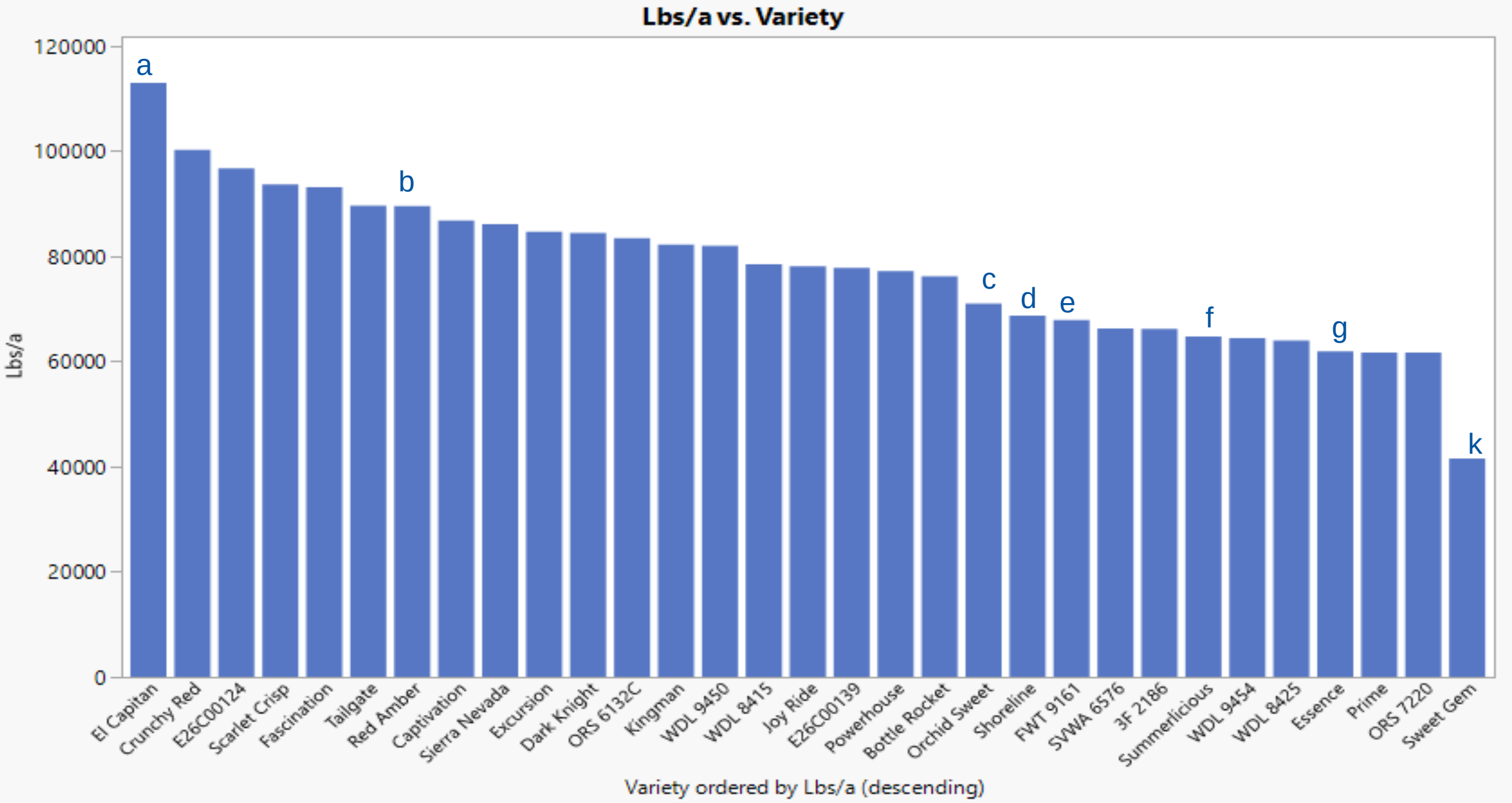

WDL 9450

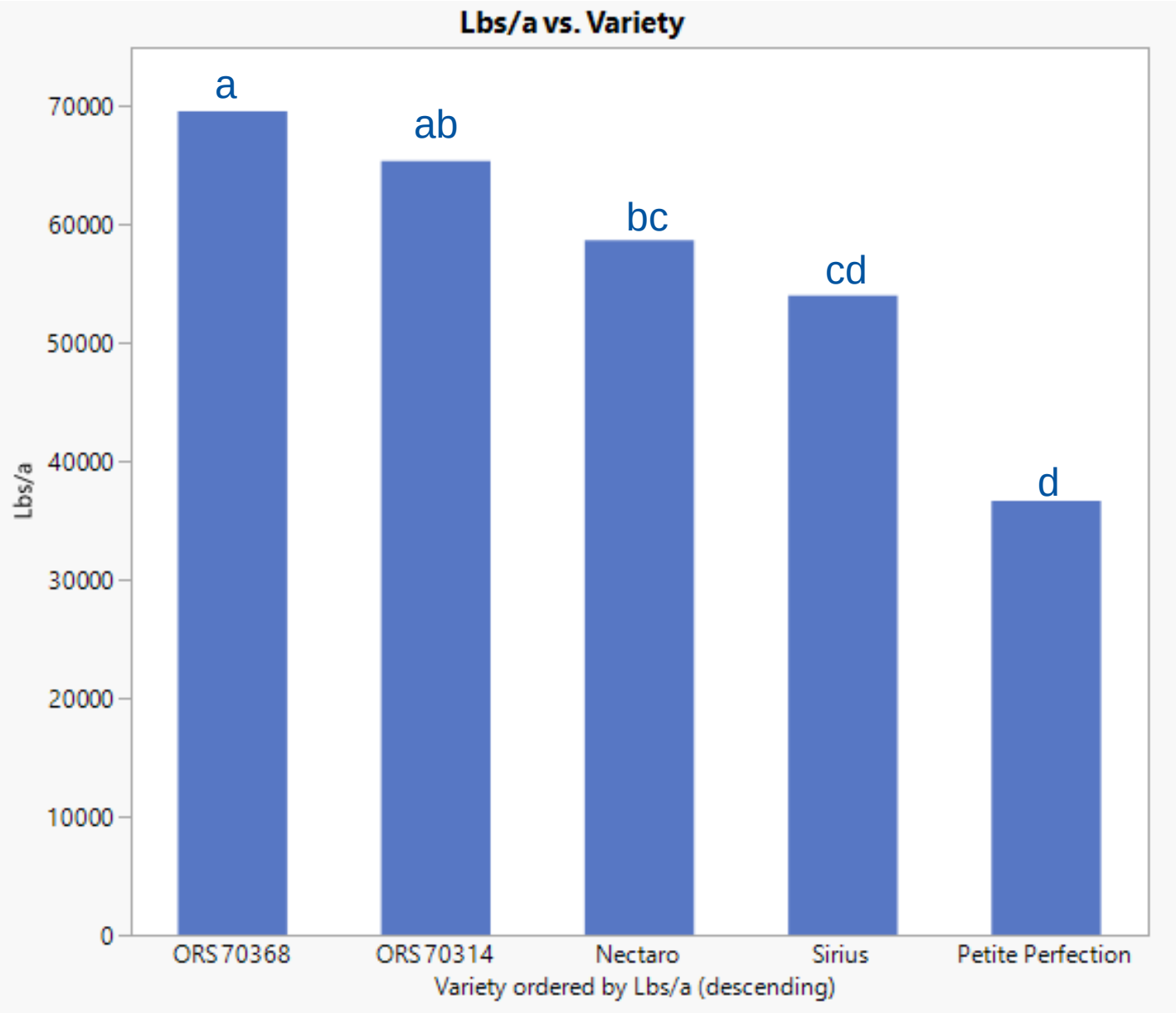

DARK
KNIGHT


SCARLET
CRISP


ORS6132C

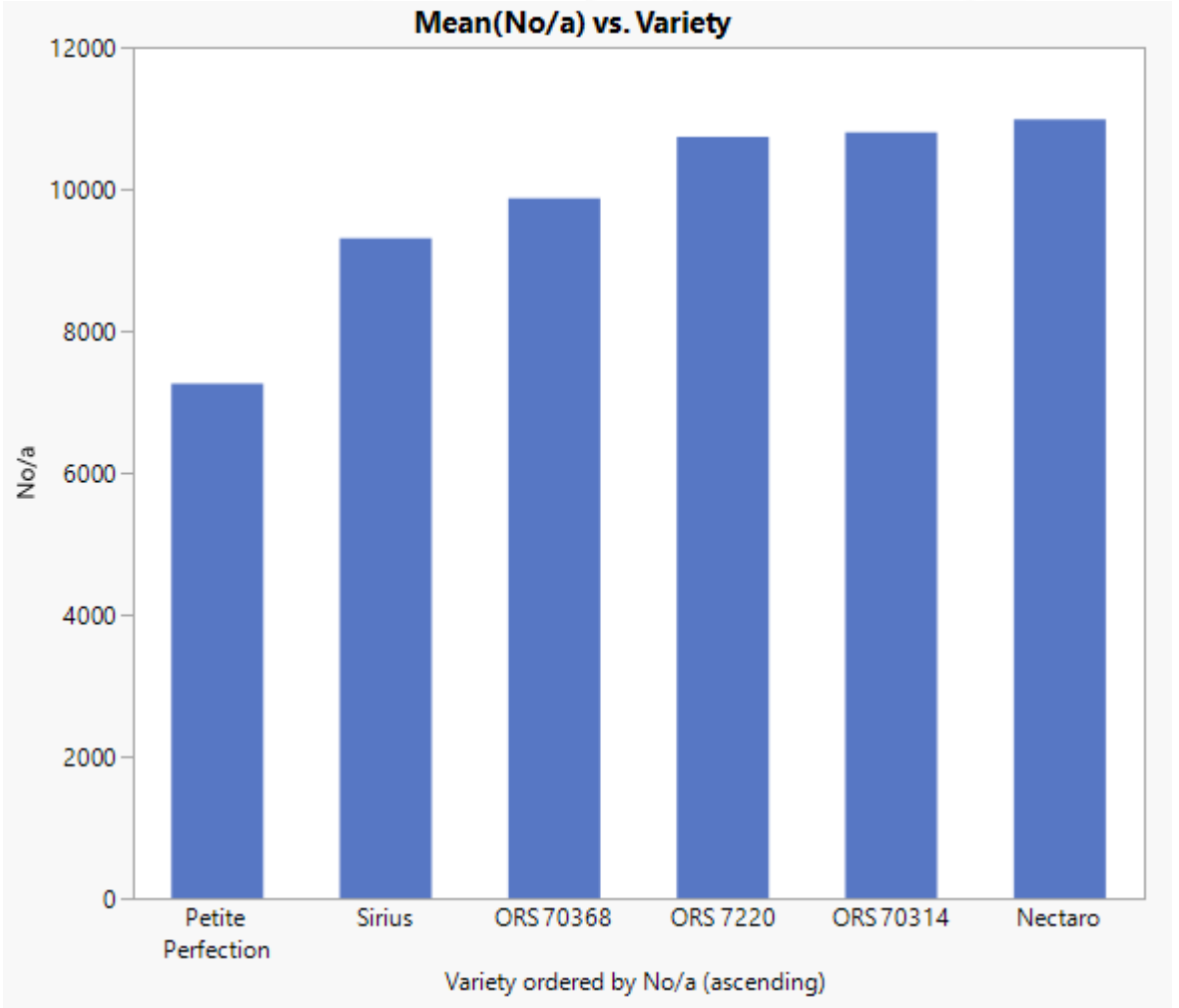

E26C00124

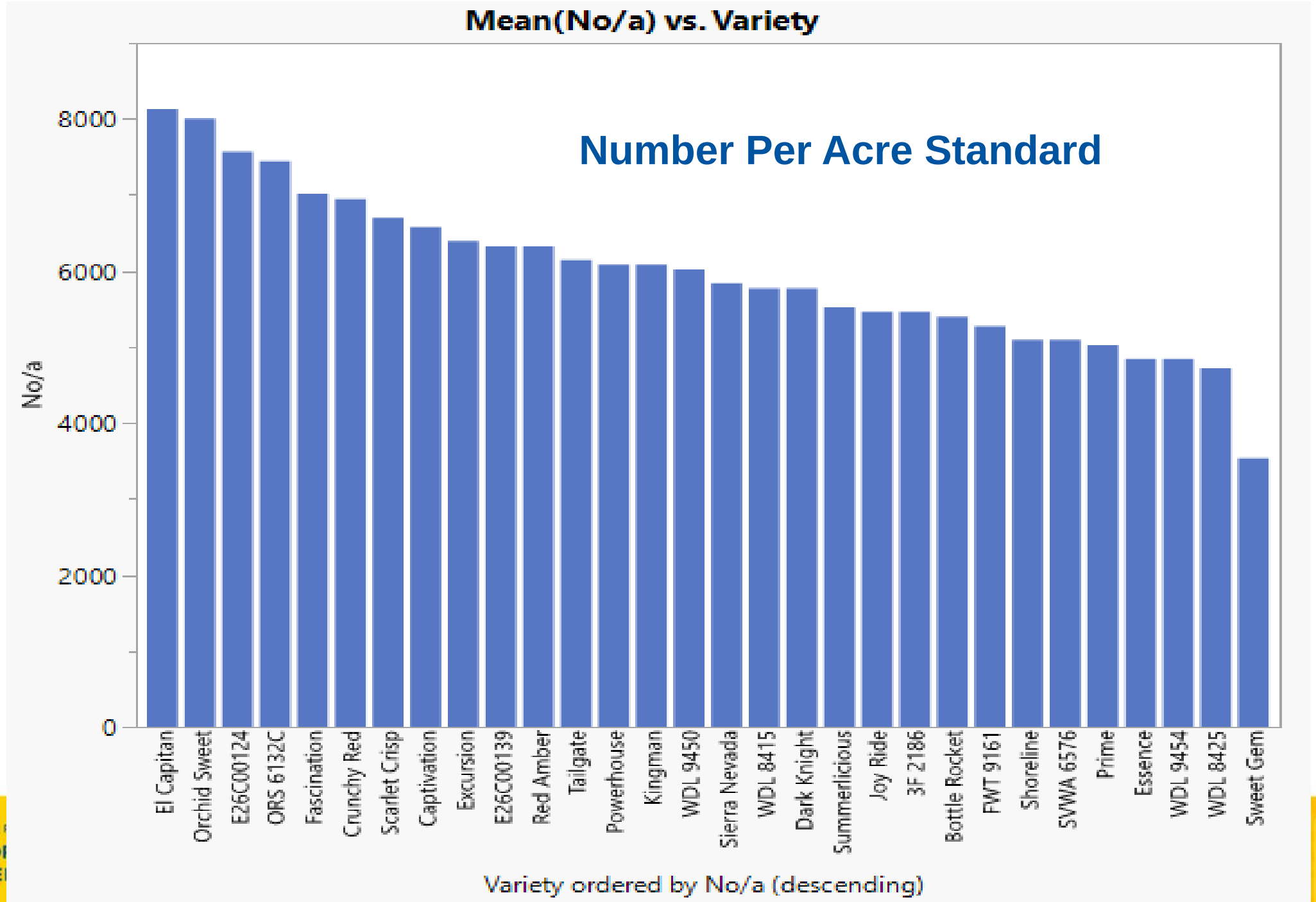

Lbs/a vs. Variety
120000
100000
80000
60000
40000
20000
0
Lbs/a
a
b
c
d
e
f
g
k
El Capitan
Crunchy Red
E26C00124
Scarlet Crisp
Fascination
Tailgate
Red Amber
Captivation
Sierra Nevada
Excursion
Dark Knight
ORS 6132C
Kingman
WDL 9450
WDL 8415
Joy Ride
E26C00139
Powerhouse
Bottle Rocket
Orchid Sweet
Shoreline
FWT 9161
SVWA 6576
3F 2186
Summerlicious
WDL 9454
WDL 8425
Essence
Prime
ORS 7220
Sweet Gem
Variety ordered by Lbs/a (descending)



Mini Watermelons

Number Per Acre Mini




Mean(No/a) vs. Variety
Number Per Acre Standard
No/a
8000
6000
4000
2000
0
El Capitan
Orchid Sweet
E26C00124
ORS 6132C
Fascination
Crunchy Red
Scarlet Crisp
Captivation
Excursion
E26C00139
Red Amber
Tailgate
Powerhouse
Kingman
WDL 9450
Sierra Nevada
WDL 8415
Dark Knight
Summerlicious
Joy Ride
3F 2186
Bottle Rocket
FWT 9161
Shoreline
SVWA 6576
Prime
Essence
WDL 9454
WDL 8425
Sweet Gem
Variety ordered by No/a (descending)

Fruit Size

Variety	Mean(lbs)
Sierra Nevada	14.8
Dark Knight	14.6
Tailgate	14.6
Crunchy Red	14.4
Joy Ride	14.3
Red Amber	14.2
Bottle Rocket	14.1
Scarlet Crisp	14.0

Size Distribution

Variety	Number	30 count	36 count	45 count	60 count
Scarlet Crisp	108	1	3	58	45
El Capitan	131	1	11	54	63
Tailgate	99	1	9	53	35
Fascination	113	0	1	50	61
Dark Knight	93	1	12	48	29
Joy Ride	88	0	7	48	33
Red Amber	102	1	10	47	44
Sierra Nevada	94	4	13	44	32
Shoreline	82	0	2	43	36
Kingman	98	0	5	42	50
Captivation	106	0	2	41	63

Size Distribution – Mini and Small

Variety	Number	45 count	60 count	lbs, 7-9	lbs, 5-7	lbs, 3-5
ORS 70368	159	1	23	52	66	17
Orchid Sweet	129	4	61	38	24	2
ORS 7220	173	0	5	29	90	49
ORS 70314	174	1	15	28	77	53
Sirius	150	1	6	25	73	45
Nectaro	177	0	4	16	82	75
Petite Perfection	117	0	0	9	54	54

Early Harvest

Variety	Number	H1	H2	H3
Orchid Sweet	129	50	62	17
ORS 70314	174	50	88	36
ORS 7220	173	41	99	33
Nectaro	177	40	103	34
Petite Perfection	117	35	57	25
Dark Knight	93	33	44	16
El Capitan	131	31	69	31
Red Amber	102	30	44	28
Tailgate	99	30	44	25

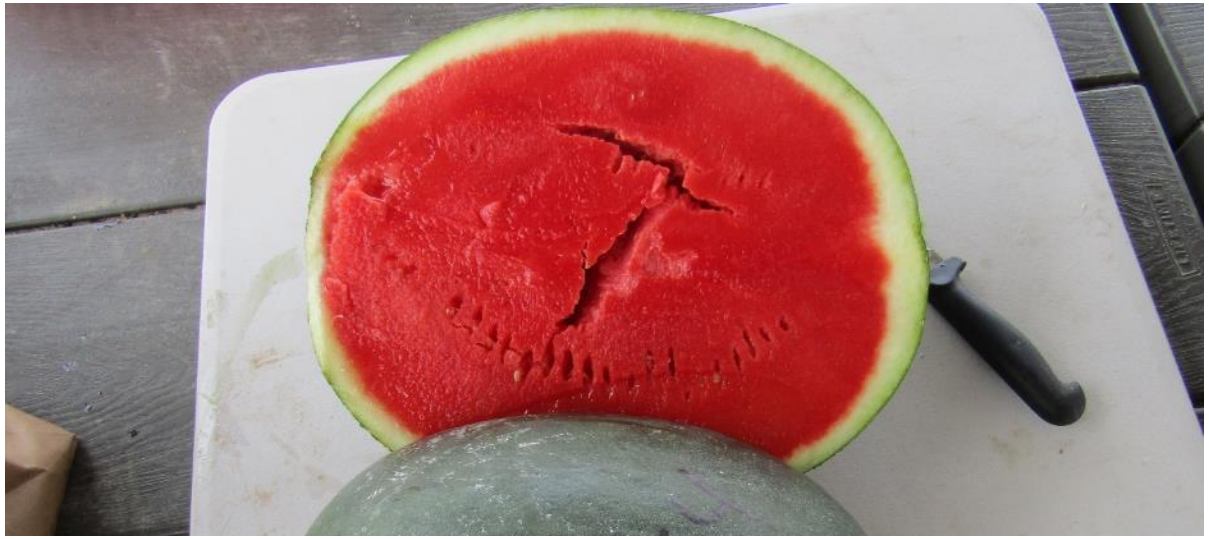
Third Harvest

Variety	Number	H1	H2	H3
ORS 70368	159	22	96	41
ORS 70314	174	50	88	36
Sirius	150	24	91	35
Nectaro	177	40	103	34
ORS 7220	173	41	99	33
Captivation	106	16	55	35
Fascination	113	19	62	32
El Capitan	131	31	69	31
ORS 6132C	120	12	78	30

Variety	SS
Joy Ride	12.2
SVWA 6576	12.2
Red Amber	12.0
Dark Knight	12.0
Prime	12.0
Fascination	12.0

Sugars Were above 11 in 2021

Hollow Heart



Variety	HH 1-5
Scarlet Crisp	2.9
Prime	2.7
Orchid Sweet	2.4
WDL 8415	2.1
Sweet Gem	2.0

Acknowledgements

- Many student and summer workers
  - Jen Jones
  - Jake Jones
  - Khashad Gillespie
- Participating Companies

Specialty Pumpkin Demonstration

Blue and Dark Green

Small Round Different Colors

Hubbards

Bumps and Warts


Sanchez


Warty
Goblin


Warty
Gnome


Grizzly
Bear


Mini
Warts

Harry Potter Types, Porcelain Doll

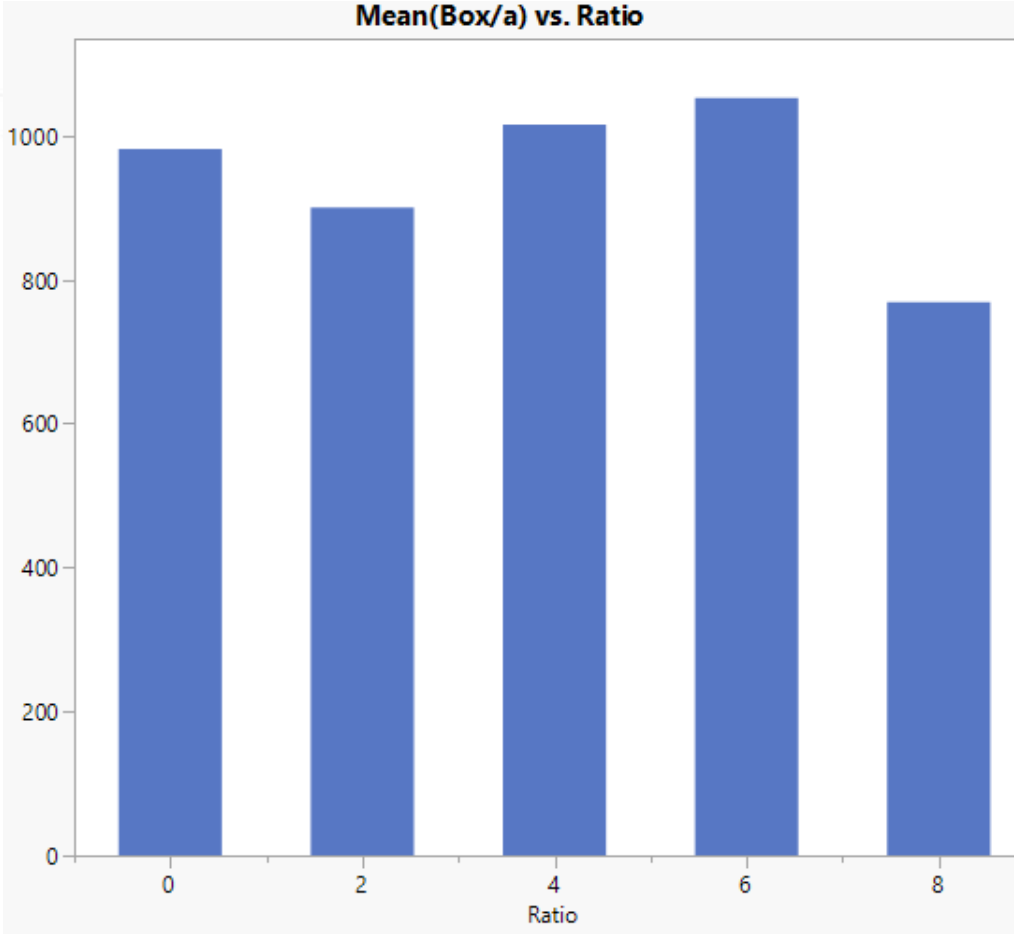
White Types Small to Large

Specialty Broccoli – Broccolini, Caulilini, Sprouting Broccoli, Gai Lan

6 Tons of Compost per acre optimized pepper Yields. 8 tons per acre, too much salt effect.

Compost Trials

- Bioenergy DevCo - Seaford



Sweet Potato

- Characteristics
  - Related to morningglory
  - Vine-like perennial that is grown as an annual
- Major types
  - Moist orange flesh
  - Dry white or yellow flesh
  - Other colors
  - Skin colors – brown, orange, red, purple
  - Use – food, feed, biofuel
  - Leaves also edible

Growing requirements

- High temperatures
- Long season 3-5 months
- Best in loose soil
  - Low organic matter
- Low fertility soils

Sweet Potatoes

Recommended Varieties[1]

Orange Flesh		White Flesh
Beauregard[2] "B-14" and "B-63" (FR)	Covington (FR, RKR)	Bonita (RKR)
Bellevue (FR, RKR)	Evangeline (FR, RKR)	O' Henry
Burgundy (FR, RKR)	Orleans (FR)	

[1]Listed alphabetically; letters in parentheses indicate disease resistance: FR = *Fusarium* wilt resistant; RKR = root-knot nematode resistant.
[2] Mericlones B-14 and B-63 have compact and extended vines, respectively.

Recommended Nutrients Based on Soil Tests

In addition to using the table below, check the suggestions on rate, timing, and placement of nutrients in your soil test report and the Soil and Nutrient Management chapter. Your state's soil test report recommendations and/or your farm's nutrient management plan supersede recommendations found below.

Sweet Potatoes		Soil Phosphorus Level				Soil Potassium Level				
		Low	Med	High (Opt)	Very High	Low	Med	High (Opt)	Very High	
	N (lb/A)	P_2O_5 (lb/A)				K_2O (lb/A)				Nutrient Timing and Method
	50-75	200	100	50	0[1]	300	200	100	0[1]	Total nutrient recommended.
	25	200	100	50	0[1]	300	200	100	0[1]	Broadcast and disk-in
	25-50	0	0	0	0	0	0	0	0	Sidedress when vines start to run.

[1]In VA, crop replacement values of 25 lb/A of P_2O_5 and 50 lb/A of K_2O are recommended on soils testing Very High.

Variety Selection

- Select variety according to market preferences, local adaptation and specific soil problems.
- Current varieties require 100 to 140 days to achieve maximum yield, depending on cultural practices, irrigation and environmental conditions.
- Use certified G1 or G2 (generations), virus tested, disease-free roots (storage root used for transplant/slip production) or slips (sprouts or cuttings for field planting) to maximize yield and quality.

USA Orange Flesh

- Beauregard B14 (LSU)
- Beauregard B63 (LSU)
- Covington (NC)
- Orleans (LSU)
- Bayou Belle (LSU)
- Bellevue (LSU)
- Burgundy (LSU)
- Diane

USA White Flesh

- Red skin
  - Murasaki-29 (LSU)
- White skin
  - Bonita (LSU)
  - O’ Henry (MS)

Site selection, soil and fertilization

- Well-drained sandy and sandy loam soils are best for sweetpotato, either bedding or production. Avoid heavy soils and soils that will stand water for more than 24 hours.
- Avoid excessive amount of organic matter (fields just broken from pastures). Soils with high levels of organic matter may promote scurf.
- Use long rotations with grains and soybean to decrease the incidence of soil-borne diseases.
- Test the soils for nematodes and avoid fields with high nematode populations and those that have had sweetpotatoes in the past two years.
- Test the soil for fertility. Optimum soil pH is 5.8 to 6.2. If lime is needed, apply it several months before planting. All phosphorus and potassium can be applied before planting. Apply half of the recommended nitrogen before planting (broadcast or band) and apply the rest at layby when vines start to run.

Plant Production

- Sweetpotatoes are propagated vegetatively by sprouts or slips from storage roots (“seed”). Select good quality, certified G1 or G2 roots that are uniform and free from insect and diseases.
- Before bedding, “seeds” should be pre-sprouted at 85 F and 90% relative humidity for 3 to 4 weeks until the sprouts are 1 to 1½ inches long. Make sure “seeds” are well ventilated because the process requires oxygen.
- For bedding, avoid sites that had sweetpotato in the past 3 years to reduce the risk of diseases. Fertilize with 4 to 5 pounds of 8-8-8, or its equivalent, per 100 sqft bed area.
- Bed “seed” stock the first week of April and use black or clear plastic mulch to warm up the soil. Minimum soil temperature for sweetpotato to grow is 60 F. Treat roots with appropriate fungicide to reduce decay

Field Planting

- Sweetpotato is cold sensitive and should not be planted until all danger of frost is past and soil temperature at 4-inch depth is 65° F. The optimum temperature for sweetpotato is between 70 and 85° F, although they can tolerate temperatures between 65 and 95° F.
- Plant slips in the field between May 5 and June 15 in warmer, southern areas and between May 20 and June 5 in cooler areas.
- Slips 12-inches long with 6-8 leaves and a good initiated root system are best.
- Plant slips on ridges 8 to 10 inches high and good soil moisture. Plant spacing is 9 to 16 inches (30 to 40cm) along rows and 40 to 48 inches (1 to 1.2m) between rows.
- If irrigation is available, water field immediately after planting and then when needed.

Irrigation

- Immediately after planting
- Then as needed based on soil moisture and evapotranspiration

Cultivation and weed control

- Preplant (Valor)
- After transplant (Command, Dacthal, Devrinol))

Harvest and Postharvest Considerations

- The sweetpotato storage root is covered by a thin, delicate skin that is very easily broken. Striking the roots with harvesting equipment or dropping them into containers injures the skin and become susceptible to diseases.
- Even if the injury heals, the scars render an unappealing storage root with no fresh market value.
- Mechanical vine killing (devining) 5 to 7 days before harvest improves skin set and facilitates harvest. Various methods can be used to harvest sweetpotatoes.
- Growers with a small area may harvest by hand using a garden fork. Use globes to keep bruises and abrasions to a minimum.
- Growers with a few acres can use a one row modified mold board plow or middle buster with a notched coulter adjusted just left of the main stems to turn the rows and expose the storage roots. Then, they are removed from the vines by hand and placed into smooth baskets.

Harvest and Postharvest Considerations

- Mechanical diggers patterned after a low flat-bed type potato digger or digger-windrower are often used. These are one or two row machines that incorporate a short separating chain behind a wide blade that elevates both soil and roots onto the chain. Soil falls through the chain as the storage roots move up with the chain and drop off to the ground in the back of the digger.
- Care must be taken to bring enough soil up with the chain to minimize bruises. Then, storage roots are picked up by hand and placed in smooth sided baskets.
- With more advanced harvesters, the storage roots continue on the chain through a platform where they are picked up by hand and placed directly into bins.
- After the roots are dug, they should be cured in the storage house at 80 to 85 F (26.7 to 29.4 C) and 85-90 percent relative humidity for 6 to 8 days.
- After curing, temperature should be lowered to 55 F (12.8 C), but relative humidity should be maintained at 85 percent for long term storage.

Conditioning for skin set

- Devine 5-7 days before harvest
- Flail and snatcher

Hand harvest and grading

- U.S.No.1 (fresh market)
  - Most valuable
  - 50% to 60% of the harvest
- U.S.No.2
  - Jumbo (processing)
  - Canners (Processing and “seed”)

Curing

- The time of harvest is determined by root size, but harvest before soil freezes
- Curing
  - Allow roots to dry on the ground
  - Cure at 80-90°F and 85-90% humidity for 5-7 days
    - Roots cut and bruise easily, but curing promotes healing
    - Curing also allows starch to convert to sugar
  - Store at 55- 60°F and 75-80% humidity

Curing

Fresh Market

- Fresh market sizes and harvest:
  - Hand harvest and selection to reduce skinning
  - Medium size roots (U.S.no.1) most valuable
  - Minimize small (canner) and large (jumbo) roots

Pests

- Sweetpotato weevil
- Wireworm
- Whitegrub
- Cucumber beetle
- Flea beetle
- Sugarcane beetle

Diseases

- Scurf
- Bacterial soft rot
- Fusarium root rot
- Circular spot
- Rhizopus soft rot
- Java black rot
- Charcoal rot

Gordon C. Johnson, PhD
Extension Fruit and Vegetable Specialist
Department of Plant and Soil Sciences
University of Delaware
Carvel Research and Education Center
16483 County Seat Highway
Georgetown, DE 19947
gcjohn@udel.edu
Office: (302) 856-2585 ext. 590
Cell: (302) 545-2397