

National Sweet Potato Collaborators Trails

at Lincoln University's
George Washington Carver
Agricultural Research Farm



Jefferson City, Missouri

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Scientific Classification

Kingdom: Plantae
 Division: Magnoliophyta
 Class: Magnoliopsida
 Order: Solanales
 Family: Convolvulaceae
 Genus: Ipomoea
 Species: I. batatas

Binomial name: *Ipomoea batatas* L.

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Sweet Potato



- A herbaceous perennial vine
- Edible long and tapered tuberous root
- Smooth skin - roots with color ranges from red, purple, brown to white
- Root flesh ranges in color from white, yellow, orange to purple

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Beauregard L99-35 L10-29 L02-32 NC98-608 NC99-573 NC-Japanese



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Sweet Potato Origin and Distribution

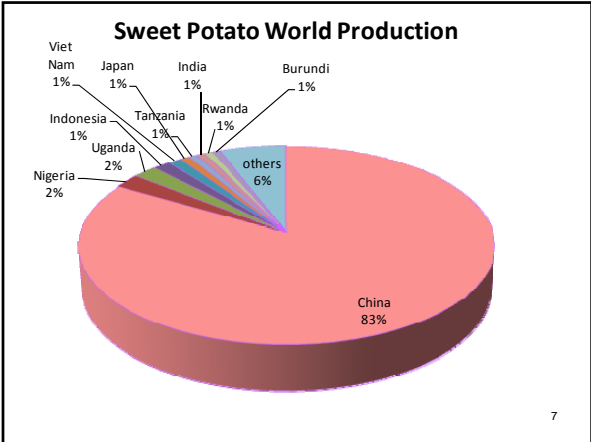
- Native to the tropical Americas and were domesticated there at least 5000 years ago
- Cultivated throughout tropical and warm temperate regions wherever there is sufficient water to support their growth

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Sweet Potato World Production

- According to 2004 FAO statistics world production is 127,000,000 ton
- China is the World's leading producer with a production of 105,000,000 tones from 49,000 km²
- Per-capita production is greatest in countries where it is a staple of human consumption
- Led by Solomon Islands at 160 kg per person per year and Burundi at 130 kg

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- ### Sweet Potato World Production cont'n
- China provides about 80% of the world's supply of sweet potatoes
 - Historically, most of China's sweet potatoes were grown for human consumption
 - Now most (60%) are grown to feed pigs
 - China grows 100 varieties of sweet potato

- ### Sweet Potato U.S.A. Production
- North Carolina is the leading U.S. state
 - North Carolina provides 40% of the annual U.S. production
 - Mississippi is also a major sweet potato producing state: ~8,200 acres

- ### Sweet Potato U.S.A. Production cont'n
- Mississippi sweet potatoes contribute \$19 million dollars to the economy of the state
 - ~150 Mississippi farmers presently grow sweet potatoes
 - The National Sweet Potato Festival is held annually the entire first week in November in Vardaman, MS: Proclaims itself as "The Sweet Potato Capitol"
 - Town of Benton, Kentucky, celebrates the sweet potato annually with its Tater Day Festival on the first Monday of April

- ### Sweet Potato Cultivation
- Does not tolerate frost
 - Grows best at an average temperature of 24 degrees Celsius (75 degrees Fahrenheit)
 - Depending on cultivar and conditions, roots mature in two to nine months
 - Sweet potato rarely flower when the daylight is longer than 11 hours

- ### Sweet Potato Cultivation cont'n
- Mostly propagated by stem or root cuttings or by adventitious roots called "slips"
 - True seeds are used for breeding only
 - Under optimal conditions of 85 to 90% relative humidity at 13 to 16 degrees Celsius (55 to 61 degrees Fahrenheit), sweet potatoes can keep for six months

Sweet Potato Field Trials in Jefferson City, Missouri

Field Planting Method

Sweet potato slips transplanted on 12 inch ridges
 Row spacing: 42 inches
 Plant spacing in row: 12 inches
 Length of row: 20 ft.
 Replications: 3
 Irrigation: As needed

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2006 Sweet Potato Planting Record

- Transplanted date: 05/23/06
- Harvested date: 10/05/06
- Number of Growing Days: 136
- Fertilizer: (lb per acre)
 - N 40
 - P₂O₅ 80
 - K₂O 120

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USDA Sweet Potato Grades

- US #1's – Roots 2" to 3 1/2" diameter, length of 3" to 9", much be well shaped and free of defects.
- Canners – Roots 1" to 2" diameter, 2" to 7" in length.
- Jumbos – Roots that exceed the diameter, length and weight requirements of the above two grades, but are of marketable quality.
- Total Marketable Yield – Sum of US #1's, canners and jumbo's
- Percent US #1 – Calculated by dividing the weight of US #1's by the total marketable weight (culls not included.)
- Culls – Roots must be 1" or larger in diameter and so misshapen or unattractive that they could not fit as marketable roots in any of the above grades.

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Selections

LA Entries

Beauregard (B94-14 G2): check line.
 L-99-35 (Evangeline): Re-entered for further evaluation.
 L01-29 (Murasaki-29): Re-entered for further evaluation.
 Boniato type, purple skin, white flesh.
 L02-32: In a few trials in 2007. Orange fleshed,
 Beauregard type with RKN resistance

NC Entries

NC98-608 (Covington): Re-entered for further evaluation
 (2/3 of NC's 2007 acreage).
 NC99-573: Re-entered. Beauregard type
 NC Japanese: Boniato type common in NC to compare
 L01-29 to. Susceptible to everything. Very good eating
 quality for this type. Very similar if not the same as
 kotopuki.

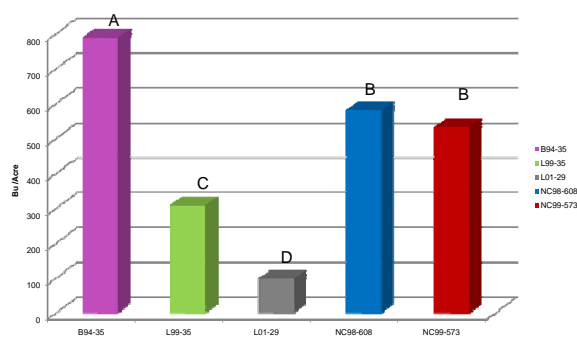
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2006 Yields for Five Selections of Sweet Potato (Bu/Acre)

SELECTION	US #1'S	CANNERS	JUMBOS	TOTAL MARKETABLE	PERCENT US #1	CULLS
L99-35	180C	69BC	59BC	308C	58A	
L01-29	51D	24C	22BC	97D	53A	
NC98-608 (Covington)	324B	118AB	138AB	580B	56A	
NC99-573	322B	124AB	84ABC	530B	61A	4A
B 94-35	447A	159A	182A	788A	57A	

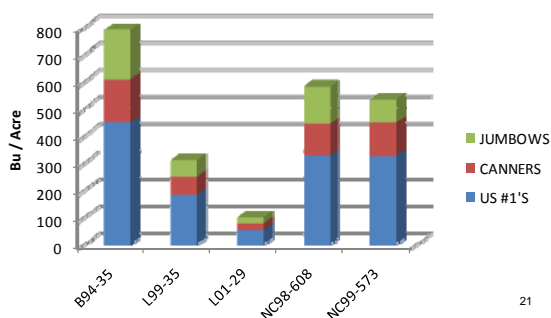
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2006 Yields -Five Selections of Sweet Potato



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2006 Yields -Five Selections of Sweet Potato



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2007 Planting Record

- Transplant date: May 13, 2007
- Harvest date: October 3, 2007
- Number of Growing Days: 121
- Irrigation: None
- Fertilizer (lb per acre): N 0
P₂O₅ 60
K₂O 60

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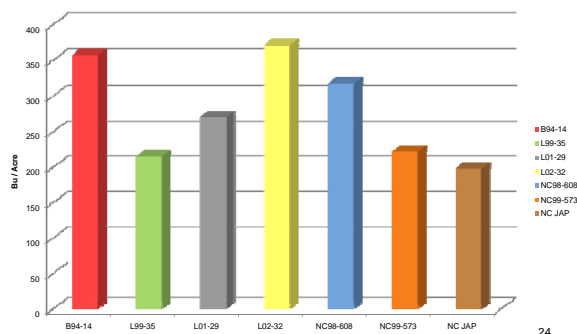
2007 YIELDS FOR SEVEN SELECTIONS OF SWEET POTATO (Bushels per Acre)

SELECTION	US#1'S	CANNERS	JUMBOS	TOTAL MARKETABLE	PERCENT US#1'S	CULLS
Beauregard B63 G1 LSU						
Beauregard B94-14 G2	169.0B	180.7AB		349.7AB	48.3B	
L99-35 (Evangeline)	124.8B	75.4C	36.4A	236.6AB	52.7B	
L01-29 (Murasaki-29)	136.5B	110.5ABC	15.6A	262.6AB	51.9B	
L02-32	286.0A	80.6C		366.6A	78.8*A	
NC99-608 (Covington)	137.8B	175.5A		312.5AB	44.1B	
NC99-573	118.3B	101.4ABC		219.7AB	53.8B	
NC Japanese	107.9B	88.4BC		196.3B	54.9B	

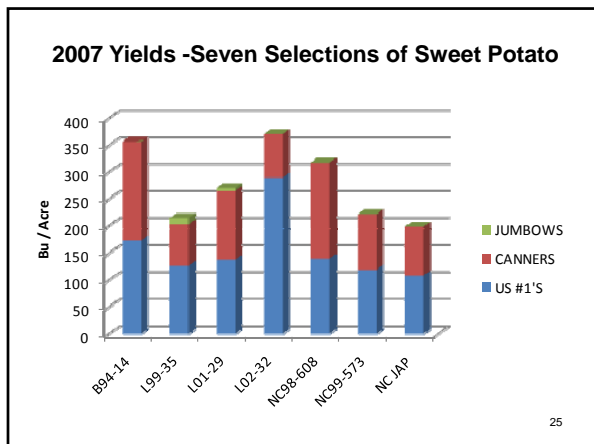
*One replica due to insufficient slips

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2007 Yields -Seven Selections of Sweet Potato



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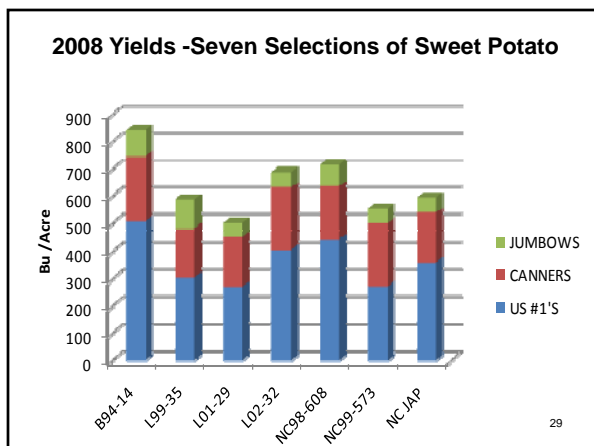
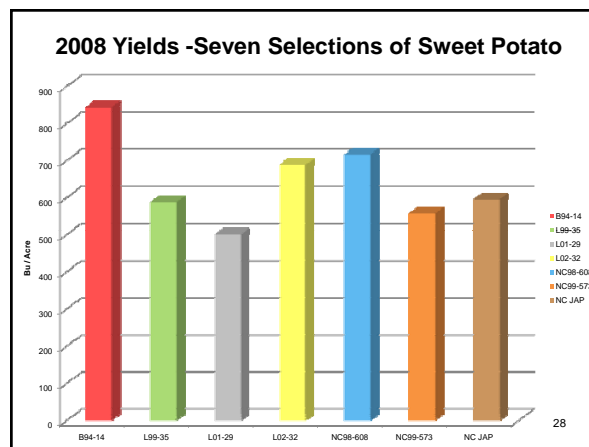


2008 Planting Record

- Transplanted Date: May 23, 2008
- Harvested Date: Sep 30, 2008
- Number of Growing Days: 129
- Fertilizer (lb per Acre):
 - N 0
 - P₂O₅ 60
 - K₂O 60

2008 Yield (Bu/Acre) Summary of Seven Sweet Potato Selections

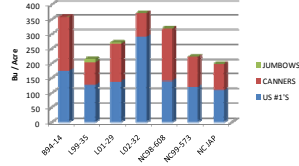
SELECTION	US#1'S	CANNERS	JUMBOS	TOTAL MARKETABLE	PERCENT CULLS US#1'S
Beauregard					
B63 G1 LSU					
Beauregard					
B94-14 G2	506.79A	241.00A	97.23A	845.02A	59.67A
L-99-35					
(Evangeline)	305.24AB	177.03A	104.95A	587.22AB	51.63A
L10-29					
(Murasaki-29)	272.41 B	182.08A	46.47A	500.96 B	53.71A
L02-32	406.43AB	226.15A	55.85A	688.43AB	59.46A
NC98-608					
(Covington)	444.12AB	192.93A	78.71A	715.76AB	62.23A
NC99-573	274.63 B	226.05A	56.56A	557.24AB	50.39A
NC-Japanese	362.55AB	177.12A	55.00A	594.67AB	60.01A



Summary

- Selection B 94-35 out performed other selections in 2006.
- In 2006, selection L01-29 produced the lowest bushel yield and the lowest yield of jumbo size roots.
- All selections exceeded 50% in the yield of US#1 size roots in 2006 with NC99-573 yielding highest.

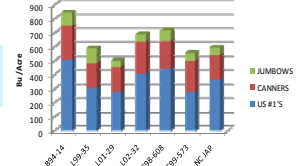
Summary Cont'



- In 2007, except for one non-replicated selection, Beauregard (B94-14 G2) yield 153 bushes more total marketable yield than the lowest yielding NC Japanese.
- No culls were produced in the 2007 crop and only L99-35 (Evangeline) and L01-29 (Murasaki) produced jumbo size roots.

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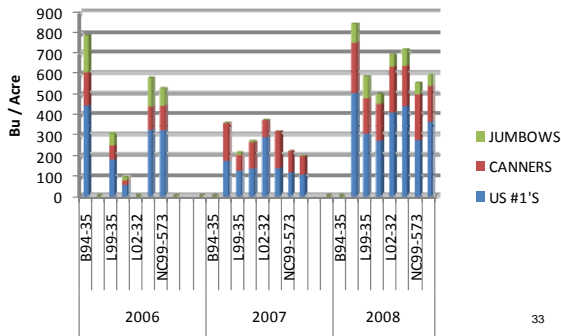
Summary Cont'



- As in 2007, Beauregard (B94-14 G2, L02-32 and NC98-608 (Covington) produce the highest total marketable yield in 2008.
- In 2008 the seven selection did not differ significantly in the production of canner and jumbo size roots.
- Selections did not differ significantly in the percent of US#1 roots produced.

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Yield Summary for Three years' Production



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