'Valencia' Rootstock Trial, Fort Meade

Dr. Bill Castle - Dr. Fred Gmitter - Dr. Jude Grosser



March 17, 2022 - updated December 06, 2021 - updated October 26, 2020 – updated November 27, 2019 - revised December 7, 2018 - posted CREC Citrus Plant Improvement

'Valencia' Rootstock Trial, Fort Meade* - Description

This trial was planted in 2017 near Ft. Meade. It consists of 2764 'Valencia' trees on 44 new rootstocks (mostly diploids and tetraploids) from the UF/CREC breeding program but also includes the California C-Series and best hybrids from the Forner breeding program (Spain) and 4 commercial rootstocks (Swingle, Kuharske, US-812 and US-942). Each rootstock is planted in solid ½ rows of 39 or 40 trees and replicated. The objective of this trial is to identify superior rootstocks for use with sweet orange on the Ridge along with observing HLB responses.

* The investigators and cooperator gratefully acknowledge the gift of trees provided by Lykes.

'Valencia' Rootstock Trial, Fort Meade – Summary

- Location: Fort Meade, Polk County
- Scion Rootstocks:
 - Valencia 44 rootstocks
- Date Planted: May 2017
- Design: Randomized complete-block. There are two groups of rootstocks: [A] Those in sufficient number to plant mostly 2-4 plots of ca. 39 or 40 trees each and used for statistical analyses; and [B] Those with only enough trees to plant 1-2 smaller-sized plots. Rootstocks [A] and [B] can be distinguished from each other by noting the total number of trees evaluated [Table 1].
 - Plot size: 39 or 40 trees
 - Spacing: 8 x 18 ft. = 303 trees/acre

Data:

- > 2018/19: Tree height rating; HLB rating.
- > 2019/20: HLB rating; yield [boxes/tree].
- > 2020/21: HLB rating; yield [boxes/tree] and tree height.
- > 2021/22: HLB rating
- > 2021/2022: Juice quality

➢ Trial status: ACTIVE

<u>'Valencia' Rootstock Trial, Fort Meade – Interpretive Summary as of April 2021:</u>

This trial was planted in 2017. The design is based on the number of trees available. Group A rootstocks were planted in a proper replicated trial as were those in Group B, but plot sizes and the number of reps were smaller in the latter group.

The trees are 4 years old. Insufficient data have been collected so far to offer any reliable observations.

Table 1. 'Valencia' rootstock trial – List of rootstocks: Groups [A] and [B], number of trees by replication and parentage.

Rootstock	Group A				Group B		#	Deventeers
Replications	1	2	3	4	1	2	# of trees	Parentage
2247 x 6070-02-2	40						40	Nova+HBP x sour orange + Flying Dragon
6058x2071-02-2					7	8	15	[Sour orange + rangpur] x [Cleopatra + Argentine trifoliate orange]
Amb + Benton	39				7	16	62	Amblycarpa + Benton
Amb + CZO					8		8	Amblycarpa + Carrizo
B11 R4 T22					4		4	Flying Dragon x C. obovoidea
BSour					10		10	Bittersweet sour orange
CS-22 [PLN1828]					31		31	Sunki x Swingle TF
C-35	40	39			11		90	Ruby swt. x WF TF
CS-54 [PLN1829]	39	40	39	40			158	Sunki x Swingle TF
CS-57 [PLN1830]	40	39	40		2	4	125	Sunki x Swingle TF
ES-4					7	8	15	King mandarin x Poncirus
ES-2					5		5	Cleo x Poncirus trifoliata (Spain)
ES-12					10	10	20	Troyer x Cleopatra
ES-3					4		4	Cleo x Poncirus trifoliata (Spain)
ES-5					9	10	19	King Mandarin x Trifol
ES-6					2		2	King Mandarin x Trifol. Or
ES-1					10	10	20	Cleo x Poncirus trifoliata (Spain)
Green 3	40	39			15		94	[Nova + HBPummelo] x [sour orange + Carrizo]
Green 7					10	10	20	[Nova + HBPummelo] x [sour orange + Carrizo]
Kuharske	40						40	Kuharske citrange, Carrizo open-pollinated zygotic
Murcott + Rubidoux TF	39	40					79	Murcott + Rubidoux
N40R1T25					2		2	Flying Dragon x LB1-21
N40R2T19					2		2	Flying Dragon x LB1-21

Table 1. [cont'd]. 'Valencia' rootstock trial – List of rootstocks: Groups [A] and [B], number of trees by replication and parentage.

Rootstock	Group A				Group B		# of troop	Deventese
Replications	1	2	3	4	1	2	# of trees	Parentage
N40R3T26					1		1	Flying Dragon x (Clementine x Duncan)
Blue 1	39						39	Nova+HBP x SO+Pal.Swt.L
Orange 14					20	20	40	[Nova + HBPummelo] x [Cleopatra + Argentine trifoliate orange]
Sorp + Sh-991					13		13	
Sour Orange + TF 50-7	39	40	39		7		125	Sour orange + trifoliate orange 50-7
Swingle	39						39	Swingle citrumelo
UFR 1: Orange 3	39	40			10		89	[Nova + HBPummelo] x [Cleopatra + Argentine trifoliate orange]
UFR 17: Green 2	39	40	39				118	[Nova + HBPummelo] x [sour orange + Carrizo]
UFR-17 used to replace C-146	39	40	39	40			158	[Nova + HBPummelo] x [sour orange + Carrizo]
UFR 2: Orange 4	40	39	40	39			158	[Nova + HBPummelo] x [Cleopatra + Argentine trifoliate orange]
UFR 3: Orange 15					7	8	15	[Nova + HBPummelo] x [Cleopatra + Argentine trifoliate orange]
UFR 4: Orange 19	39	40	40				119	[Nova + HBPummelo] x [Cleopatra + Argentine trifoliate orange]
UFR 5: White 4	40	39			25		104	[Nova + HBPummelo] x [Succari + Argentine trifoliate orange]
UFR 6: Changsha+TF 50-7	40	39	40	39			158	Changsha mandarin + trifoliate orange 50-7
US 802	40	39			15		94	Pummelo x TF
US 897	39	40	39				118	Cleo x TF
US-812	39	40					79	Sunki x Benecke TF
US-942	40	39	40				119	Sunki x FDT
Wgft + TF 50-7	39	40	39				118	White grapefruit + trifoliate orange
White 1					26		26	[Nova + HBPummelo] x [Succari + Argentine trifoliate orange]
White 3	40				10		50	[Nova + HBPummelo] x [Succari + Argentine trifoliate orange]
x 639	40	39	40				119	x-639 Cleopatra x Rubidoux TF

Fig. 1. 'Valencia' rootstock trial – Tree height and HLB rating of Group A and B rootstocks: mean + std. dev. [December 2018].



0= dead or severely declined.

1= overall poor condition; lt. crop; small fruit, most dropped. 2= some leaf symptoms and decline with significant fruit drop.

3= average-fair condition; good crop; little drop.

4= good tree condition; few leaf symptoms; good crop; little drop. 5= excellent tree condition/crop

1 = < 3ft $2 = 3ft^4ft$ 3 = over 4ft

CREC Citrus Plant Improvement

Fig. 2. 'Valencia' rootstock trial – Yield of Group A: mean + std. dev. [boxes/tree, February 2020 & March 2021]. Tree age: 3.5 years.



Fig. 3. 'Valencia' rootstock trial – Yield of Group B: mean + std. dev. [boxes/tree, February 2020]. Tree age: 3.5 years.



Fig. 4. 'Valencia' rootstock trial – HLB rating of Group A and B rootstocks: mean + std. dev. [November 2019 & October 2020 & December 2021].



- 2= some leaf symptoms and decline with significant fruit drop.
- 3= average-fair condition; good crop; little drop.
- 4= good tree condition; few leaf symptoms; good crop; little drop.
- 5= excellent tree condition/crop

Rootstock [no of trees evaluated]

(*) Rootstocks without a bar, std. dev. = 0

Fig. 5. 'Valencia' rootstock trial – HLB rating of Group A and B rootstocks: mean. [November 2019 & October 2020 & December 2021].



Fig. 6. 'Valencia' rootstock trial – Tree height of Group A: mean + std. dev. [ft., April 2021].



Rootstock [no of trees evaluated]

Fig. 7. 'Valencia' rootstock trial – juice Acid: mean + std. dev. [March 2022].



Fig. 8. 'Valencia' rootstock trial – juice Brix: mean + std. dev. [March 2022].



Fig. 9. 'Valencia' rootstock trial – juice Ratio: mean + std. dev. [March 2022].



Fig. 10. 'Valencia' rootstock trial – juice Color: mean + std. dev. [March 2022].



Rootstook

Fig. 11. 'Valencia' rootstock trial – PS/box: mean + std. dev. [March 2022].



Rootstook