

Environmental & Tree Condition Effects on Sheepnosing and PH Decay in Grapefruit

Fertilizer N and High Temperature
Variety, Rootstock, Canopy position

PIs: Jim Syvertsen, Gene Albrigo, M. Ritenour
J. Dunlop, Bob Pelosi, Mike Barton
UF, IFAS, CREC LA & IRREC FP
FDOC 2001-2003

Literature

Normal

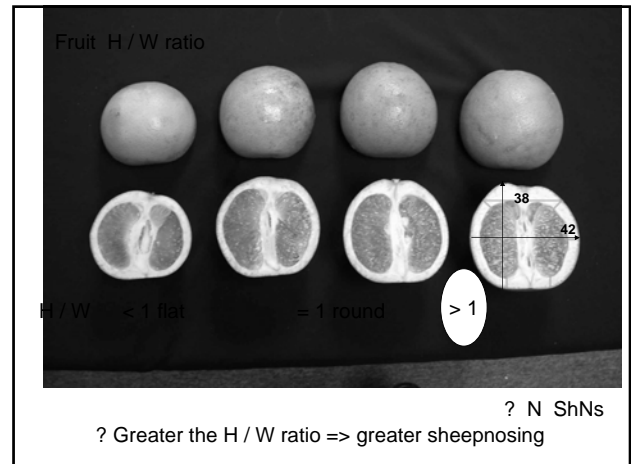
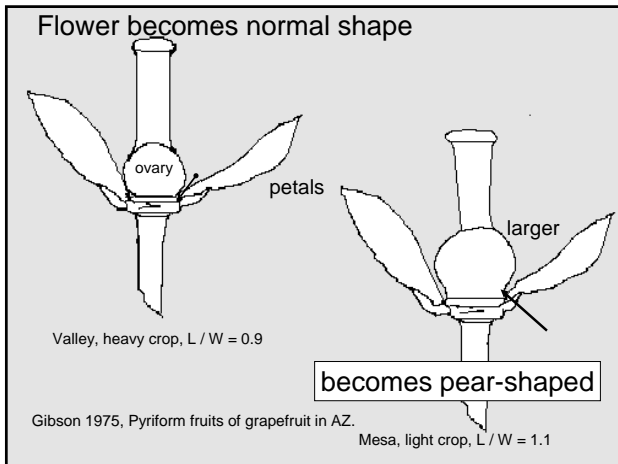
Coastal
Heavy fruit set
Mature trees
Low nitrogen

Sheepnosed

Desert, inland (hi T, ? lo RH)
Thicker, rough peel
Light crop (Alt. bearing)
Warm day, cool nights
Juvenile trees
High N

Growth :

Water relations, ET, soil type, rootstock...
confusion



Tree N RR Grapefruit/CC Gapway H / W ratios						
Variety	N rate	Height	Width	H/W	Leaf N	Fruit N
RR Gft /	(lbs/Ac)	(mm)	(mm)		(%)	(%)
CC	0	104 a	112 ns	0.93 ns	2.40 **	0.87 ns
Dec 01	100	102 ab	110	0.93	2.36	0.91
	150	98 cd	106	0.93	2.39	0.9
	200	100 bc	114	0.93	2.56	0.92
	250	97 d	105	0.92	2.67	0.94
				N increased Higher yields up to 200#, tended to be smaller fruit < 1, flat		
(Schumann et al. 2001-02)						

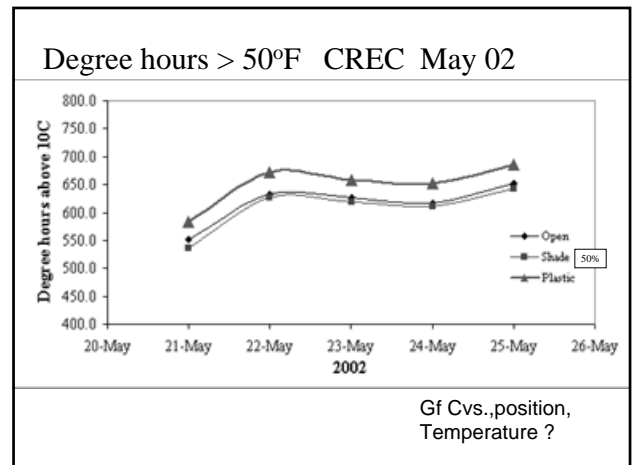
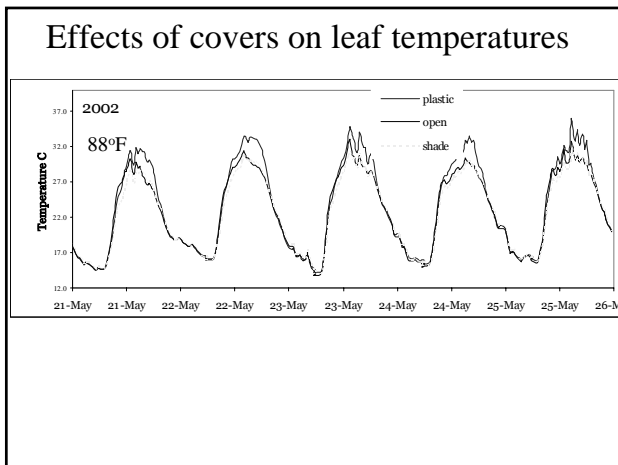
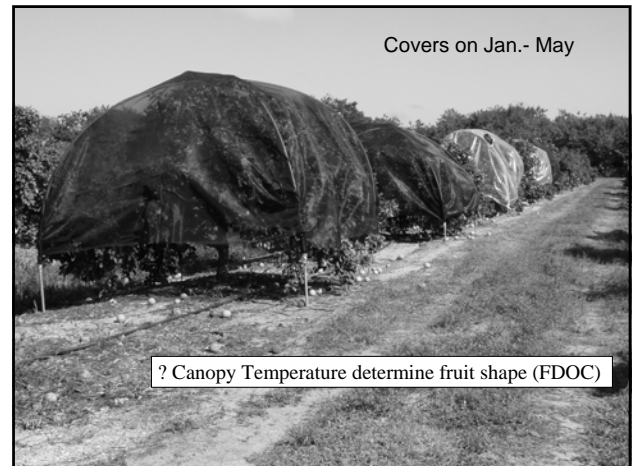
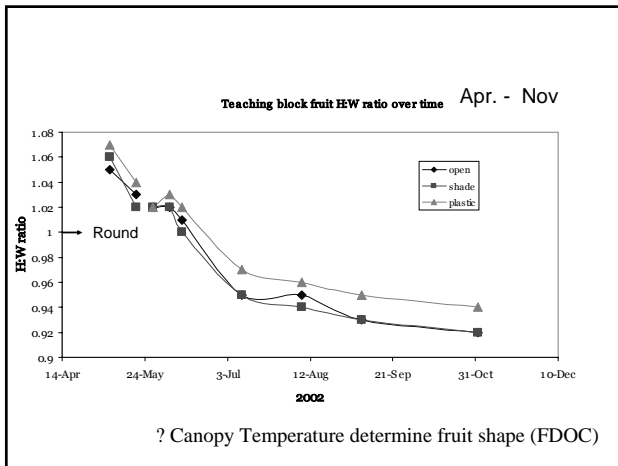
Gapway 2002 Shape Ratings							
N x Posi x cluster		6x2x2x30=720 total fruit					
250 # 100 #	July 02	Sheep (%)	Rnd (%)	Flat (%)			
	Tree (n)						
	High N	6 (40 a)	51 ns	9 b			
	Low N	6 (26 b)	49	24 a			
	ns	East	12 (35 ns)	47 ns	17 ns	360	? single > clustered →
	West	12 (32)	53	16	360		
		Single	12 (27 b)	53 ns	19 ns	429	Hi N, crop, clustered
		Cluster	12 (39 a)	47	14	291	
		Nov 02					
			(%)	(%)	(%)	(mm)	(mm)
	Fruit (n)	Sheep	Rnd	Flat	Height	Width	H:W
	High N	360 (14 a)	64 a	21 b	83 b	92 b	0.91 b
	Low N	360 (3 b)	53 b	43 a	87 a	93 a	0.93 a
	East	360 (4 ns)	61 ns	37 ns	84 b	92 b	0.91 b
	West	360 (13)	56	30	86 a	94 a	0.92 a

July High vs. Low N						Gapway 2002	
Single Frt.	429	(%)	(%)	(%)			
TMT	Tree (n)	Frt (n)	Sheepn	Round	Flat		
High N	6	248	29 ns	59 a	10 b	~100%	
Low N	6	181	24	47 b	27 a		
East	12	205	29 ns	47 ns	21 ns		
West	12	224	25	57	16		
Clustered Frt.	291	(%)	(%)	(%)			
TMT	Tree (n)	Frt (n)	Sheepn	Round	Flat		
High N	6	112	50 a	42 ns	7 b	~100%	
Low N	6	179	28 b	51	20 a		
East	12	155	40 ns	46 ns	13 ns		
West	12	136	38	48	14		

? fruit drop

Gapway 2002							
				Shape July vs. Nov			
Across Trts				No N effect			
% Drop Jul - Nov				Jul - Nov			
				#	%		
Shape	3-Jul	22-Nov	% Drop	S-S	52	25%	
Sheep	214	206	4	S-R	133	65%	
Round	377	365	3	S-F	21	10%	
Flat	129	120	7				
	720	691	4%	R-S	10	3%	
Total fruit Drop		29		R-R	253	69%	
				R-F	102	28%	
				F-S	0	0%	
				F-R	22	18%	
				F-F	98	82%	

? H / W ratio



Teaching block harvest data in Nov 2002							
Total of 36 trees sampled, 9 trees of 4 variety / SwC.							
3 cover treatments, 3 trees of each treatment.							
30 fruit from the north side and 30 from the south side.							
4 Var x 3 Covers x 3 Trees x 2 posi x30 frt= 2160				(%)	(%)	(%)	
TMT	frt n	Height	Width	H:W	Sheepn	Rnd	Flat
Marsh	540	84 b	93 b	0.91 a	5 ns	63 ns	30 ns
Ruby	540	85 a	95 a	0.90 b	6	59	33
Ray Ruby	540	83 c	93 b	0.90 ab	8	53	38
Flame	540	85 ab	94 b	0.91 a	7	53	39
North	1080	84 b	93 ns	0.90 b	6 ns	57 ns	36 ns
South	1080	85 a	94	0.91 a	8	57	33
open	720	83 b	92 b	0.90 b	4 b	52 ns	43 a
shade	720	83 b	93 b	0.89 c	2 b	55	35 ab
plastic	720	87 a	97 a	0.92 a	14 a	62	24 b

↑ ↑ ? % drop, seasonal

Teach Bk Fruit Drop							= 2160 pooled	
Fruit Count		Fruit %		Fruit Loss				
	15-Jul	19-Nov	15-Jul	19-Nov	#	%		
Sheep	172	142	7%	8%	30	17%	greater drop	
Round	953	876	44%	44%	77	9%		
Flat	1051	952	48%	48%	99	10%		
Total	2176	1970	100%	99%	206	9%		
Across trts.								
Shape : Shape		July	November	Within cover treatments				
		#	%	Plastic	Open	Shade		
Sheepnose : Sheep		84	59%	most				
Sheepnose : Round		58	41%	66% 50% 39% Sn-Sn 61% improved				
Sheepnose : Flat		0	0%					
Total		142	100%					
Round : Sheepnose		41	5%					
Round : Round		711	81%	most				
Round : Flat		124	14%					
Total		876	100%					
Flat : Sheepnose		12	1%					
Flat : Round		366	38%					
Flat : Flat		574	60%	most				
Total		952	99%					

? N appl. method
Crop load

Block 22 Grfruit rated January 24, 2003				Ground N (%) Fruit			
2 N Fert Appl x 2 Crop loads (paired tr.) x				TMT	Tree (n)	Sheepn	(n)
10 Trees x 2 posi x 30 frt ~ 2400				Hi Crop	10	25.4 a	678
				Lo Crop	10	13.9 b	640
TMT	Tree (n)	(%) Sheepn	Fruit (n)	East	20	20.0 ns	660
Ground N	20	19.6 a	1318	West	20	19.1	658
Foliar N	20	12.2 b	1344	Single	20	15.4 ns	1012
Hi Crop	20	16.1 ns	1369	Cluster	20	23.8	306
Lo Crop	20	15.6	1293				
				Foliar N	Tree (n)	(%) Sheepn	Fruit (n)
East	40	14.9 ns	1353	TMT	10	7.1 b	691
West	40	16.8	1309	Hi Crop	10	17.3 a	653
Lo Crop	40	15.6	1293	Lo Crop	10	17.3 a	653
East	40	14.9 ns	1353	East	20	9.7 ns	693
West	40	16.8	1309	West	20	14.6	651
Single	40	10.9 b	1821	Single	20	6.4 b	809
Cluster	40	20.8 a	841	Cluster	20	17.9 a	535

single > clustered
? Rootstock

South Lys. RR Grapefruit Shape rated Jul & Nov 2002						
2 Rlst x 4 Trees x 2 posi x 30 fruit= 480						
			Hedged in March			
SO - Volk		E - W				
2-Jul-02						
TMT	Tree (n)	(%) Shpnose	(%) Flat	(%) Round	Frt. (n)	
SO	4	28	11	61	240	Overall large %
Volk	4	38 ns	16	47	240	of ShNs in July
East	8	33	17	50	240	much variation
West	8	37	11	52	240	Trts. ns
Single	8	25	18	57	324	single > clustered
Cluster	8	40 ns	9	51	156	
14-Nov-02						
TMT	Tree (n)	(%) Shpnose	(%) Flat	(%) Round	(mm) height	(mm) width
SO	4	25	32	43	86.9	91.0 b
Volk	4	19	46	29	87.2	93.6 a
East	8	25	46	43	86.5	92.1 ns
West	8	23	38	39	87.7	92.4

S. Lys. RR GF on SO and VL rootstock						
Fruit drop and % change in fruit shape from summer to harvest						
2 Rlst x 4 Trees x 2 Posi x 30 fruit = 480 fruit pooled						
Fruit Count		Fruit %		Fruit Drop		
	2-Jul	14-Nov	2-Jul	14-Nov	#	%
Sheep	149	131	31%	30%	18	12%
Round	255	235	53%	54%	20	8%
Flat	76	70	16%	16%	6	8%
Total	480	436	100%	100%	44	9%
July : November						
Shape : Shape		#	%			
Sheepnose : Sheep		75	57%	majority		
Sheepnose : Round		39	30%			
Sheepnose : Flat		17	13%	?high		
Total		131	100%			
Round : Sheepnose		26	11%			
Round : Round		123	52%	majority		
Round : Flat		86	37%			
Total		235	100%			
Flat : Sheepnose		1	1%			
Flat : Round		5	7%			
Flat : Flat		64	91%	majority		
Total		70	99%			

? Postharvest storage?

Sheepnosing / PH Decay 2002-03 Ritenour et al.					
Covered 4 Feb - 10 June. Harvest 14 Jan, washed, waxed					
Stored @ 50° F and 90% RH.					
Treatment	% Healthy	%StEndRt	% Decay	% Pen	% Anth
Control	68% a	27% b	32% b	4%	2%
Shade	47% b	50% a	53% a	2%	1%
Plastic	56% b	42% a	44% a	2%	0%
North	55%	41%	45%	3%	1%
South	58%	38%	42%	2%	1%
P values					
Treat	0.0021	0.0002	0.0021	0.3827	0.5152
Direction	0.7036	0.7751	0.7029	0.7204	0.8023
Treat * Direction	0.7386	0.6917	0.7387	0.4337	0.5883

? Spring time Cu spray
Temp. ± and Humidity +

Summary

Gapway N rate: Higher % Sheepnosed at high N
More SpNs in clusters than single frt.
E = W ns, ShNs decreases during season; H / W ratio NG
Jul-Nov: ShNs-Rd = **65%**
Very few Rnd & no Flat become Sheepnosed

Teaching Blk: Majority of July shape = Nov. shape (good indicator)
So, no evidence that shape deteriorates, but
Improves on the tree from July to Nov... (? late)

- No Variety differences, N = S Position;
- Clear Plastic covers: hot & humid, Increased ShNs & H/W ratio,
- Shading improved fruit shape Hi T & Humidity effects +SER
- Larger % of Sheepnose dropped;

con't

Summary

Block 22: Foliar applied N Decreased Sheepnose;
- w/in Foliar: Low crop inc. ShNs (supports lit.)
- w/in Soil applied N : High crop inc. ShNs
- Cluster ShNs > Single

Rootstocks: RR/ VL & /SO: No effect of rootstock,
or canopy position
- Overall High % sheepnosed (? Hedging timing)
- more single frt > clustered but were more ShNs
- Majority of July shape = Nov. shape (early indicator)

PH % SER increased by shade and plastic.

In progress...Late harvest?