

Factors contributing to Green Plants at Maturity

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What is the Green Plant Malady?

- Abnormal condition where, after normal pod maturity, the plant remains completely or partly immature
 - Plants can have a complete leaf canopy or partial canopy. Or, can just be green stems.
 - Many different types or levels of greenness with many different causes
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History of Green Plant Malady

- First widespread occurrences of green fields in Louisiana were reported in the 1970 - 80s – causes were identified as mostly stinkbug damage but also, viruses, microplasmas or phytoplasmas were the cause.
 - Twenty years later in the 1990 - 2000s the problem became more extensive and the causes were not always identifiable. These problems seem to be different from what we had before 1990s.
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What has changed?

- Number of Factors contributing to green plant malady have increased
 - Plant genetics have changed – no longer just determinate and indeterminate varieties
 - Interactions of genetics with environment have increased as varieties are grown out of their “comfort zone”.
 - Management practices have changed
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Causes of Green Plant Malady

- **Environmental**
 - **Pathogens**
 - **Insects**
 - **Physiological responses to external signals**
 - **Variety**
 - **Management practices, chemicals applied.**
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Different types of Green Plants

- 100% green canopy at maturity, pod set normal and seed development normal.
 - 100% green canopy at maturity, various levels of pod retention and seed development.
 - 100% canopy at maturity, lots of single seeded pods, low yields but seed are normal.
 - 100% canopy at maturity, pod set normal, no seed in the pods.
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Different types of Green Plants

- 100% green canopy at maturity, extensive bud proliferation, few single seeded pods.
 - Various levels of green canopy with 100% green stems, pods and seed are normal - usually variety related.
 - No green canopy at maturity, various levels of green stems, pods and seed are normal – always variety related.
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Problems caused by Green Plants (Why are we interested?)

- **Low yields or total loss of yield.**
 - **Deterioration of seed quality.**
 - **Green plants slow harvest - True green plant malady does not respond well to application of desiccates.**
 - **Often growers do not recognize the problem until it is too late to save the crop.**
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JSG7582nRR







2006





UGA1242003

Effect of stink bugs on Green Plant

Treatment	No. sprays	Green stems, %	Leaf retention, %
Non-trt.	0	49	53
Orthene	4	15	10
Orthene	5	8	5
Orthene	6	4	2

– Sprays started at R4; 0.8 lb ai/acre

– *Data from R. Leonard*





2006



Causes of green plants related to physiological responses

- Early maturity - March vs later PD
 - Planting too early
 - Percentage of green plants in Group 3 variety test at March and April PD
 - Late maturity
 - Planting too late
 - Planting late varieties
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Seed Quality of Group 3 varieties at two PD.

	March 15	April 15
Variety	Seed Quality, 1 to 5	Seed Quality, 1 to 5
	3	2
Delta King 3964	3	2
Delta Grow 3960RR	3	2
Delta King 3967	3	2
Terral TV39RS31	3	2
Progeny 3900RR	3	2
Dyna Gro 31J39	4	2
Pioneer Brand 93M95	3	2
Terral TVX39R017	3	2
Progeny 3906RR	3	3
Croplan RC3935	2	2
Hornbeck HBKR3824	3	2
Asgrow AG3905	3	2

Planting date effect on percentage green plants

• Variety	<u>Planting Date, 2008</u>			
	Mar 18	Apr 7	May 5	May 25
• NK 39A3	100	79	59	46
• NK 38D5	100	60	32	17
• P 94B73	61	60	43	74
• TV 48R14	97	81	67	81
• DK 4967RR	57	20	0	20
• DP 4724RR	46	19	0	15
• TV 55R15	74	21	23	14
• P 95M80	68	16	0	16



PD - 18 Mar
Var - NK39A3



PD - 25 Mar
Var - NK39A3



PD - 15 April
Var - NK39A3



PD - 5 May
Var - NK39A3

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Drought Stress Effects on Green Plant Occurrence







Irrigated – 37% green stem
No leaf retention

Not irrigated – 79% green stem
20% leaf retention



Variety Effects on Green Plants

Table 1. Green Stalk ratings for selected varieties, Macon Ridge Research Station, Winnsboro, 2008.

Variety	Green stem rating	Yield
	----- Percent -----	----- Bu/ac -----
Asgrow AG 4405	0	39
Progeny 4906RR	0	50
Asgrow AG 4907	10	36
DynaGrow DG 37F46	10	38
Pioneer 94Y70	20	63
NK S45-E5	50	50
DeltaKing 4995	100	65
NK S49-H7	100	70

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Green plant percentage and yields in the 2009 Louisiana Variety Trials

Variety	Green stem, %	Leaf retention,%	Yield, bu/acre
Schillinger 495RC	78	0	85
DG 4975RR	45	0	83
NK S49-H7	100	50	76
NK S48-C9	100	0	76
Morsoy RT4919N	100	100	75
Terral TV 47R18	7	0	71
AsGrow AG4903	8	0	70
Croplan RC 4757	3	0	67
Armor 53-Z5	100	100	68





DG 4870RR





HBK R4729



REV RV49R11



torsoy RT 4919N



AG5405



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Salt (Chloride) damage





Fungicide x Roundup Trial for Green Plant Effects

2009 Green Stem Evaluations

Variety	Fungicide			
	No		Yes	
	No RU	RU	No RU	RU
	----- Percent green plant -----			
NK S49-47	57	63	71	87
P 94Y90	15	22	38	60
T 48R14	38	34	50	65
P 4906RR	57	62	92	84
DP 4888RR/S	38	40	39	47
P 95Y20	10	23	13	21

Data from B. Padgett



Fungicide x Roundup Trial for Green Plant Effects

What to do when a field has the green plant malady?

- Desiccate the crop and harvest as soon as possible after pods are mature to preserve yield and quality.
 - Try to determine the possible contributing factors, examine the environmental stresses – insects, drought, planting date, day length, chemicals applied and timing.
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Remedies for Green Plant Malady

- **Control insects. This is paramount.**
- **Plant varieties with history of normal maturity.**
- **Plant under conditions and dates conducive to less stress. Match varieties to the PD.**
- **Avoid late maturing varieties and late planting when possible .**
- **Avoid stresses that limit pod set and fill.**
- **Know the expected maturity date of all fields.**





Thank You

Questions?