

ENHANCING COTTON PRODUCTION BY INCORPORATING SOD INTO TRADITIONAL ROW CROPPING SEQUENCES IN VIRGINIA: ANOMALY OR REALITY?

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An aerial photograph of a rural landscape. In the foreground, a two-lane road curves from the bottom left towards the center. To the right of the road is a large, dark, rectangular field, possibly a soybean field. Further back, there's a cluster of small buildings, including what looks like a barn and some smaller structures. To the right of the buildings is another large field, this one lighter in color, possibly a corn field. In the background, there are more fields, some trees, and a small body of water on the far right. The sky is overcast.

Summary

- Introduction
- Materials and Methods
- 2006 - Cotton
- 2007 - Peanuts
- Producer survey results
- Conclusions
- Future

Justification

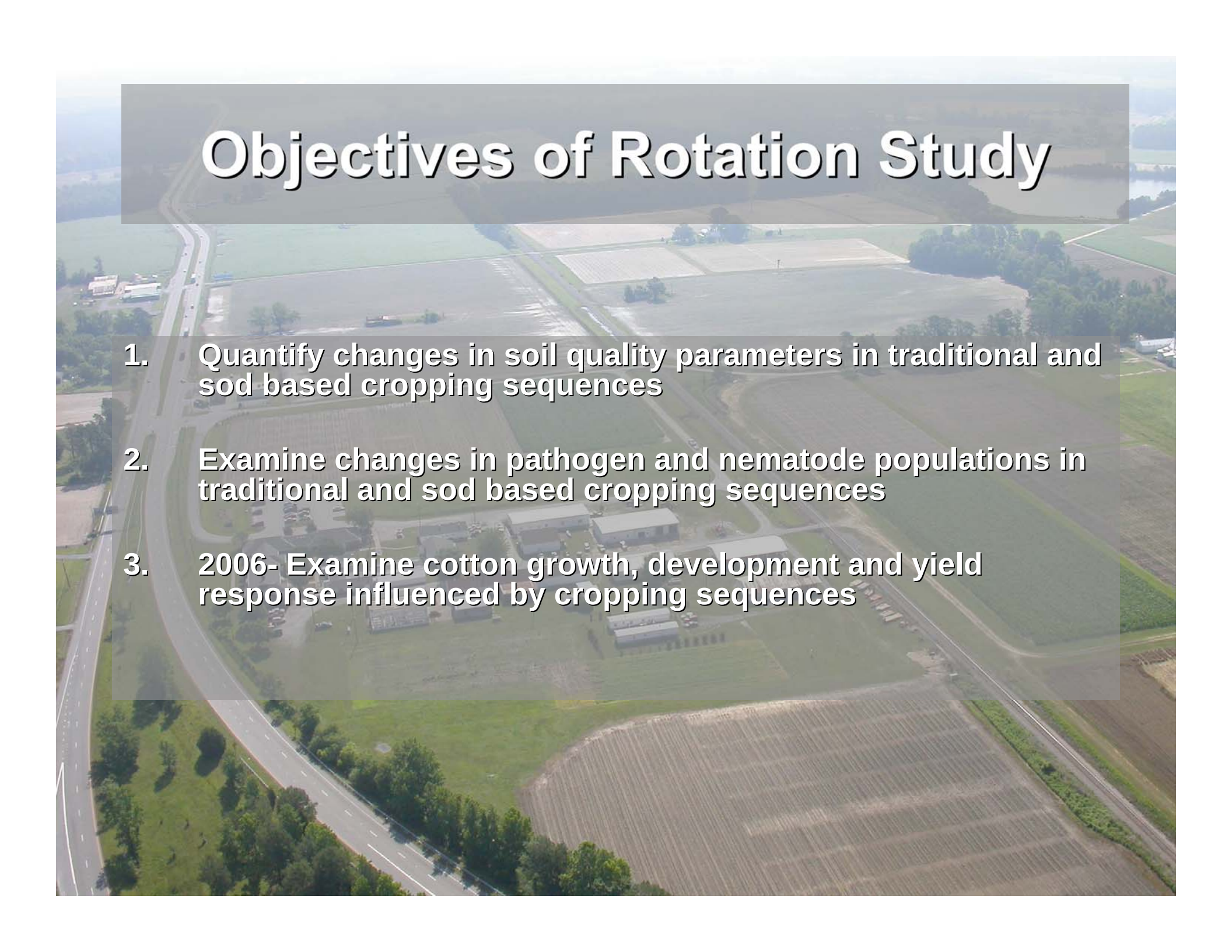
- University of Florida, Auburn, and University of Georgia bahiagrass research
- Next farm bill
- Reduce risks
- Reduce pesticide load
- Moisture conservation
- NRCS programs
- Horse farms

Why Orchardgrass and Fescue?



Current Tillage



An aerial photograph of a rural farm area. A two-lane road curves through the left side of the image. To the right of the road is a large, light-colored rectangular field, possibly a soybean field. Further right is a large, dark-colored field, possibly a corn field. In the center, there is a small cluster of farm buildings, including a house and several barns. The background shows more fields and a line of trees under a clear sky.

Objectives of Rotation Study

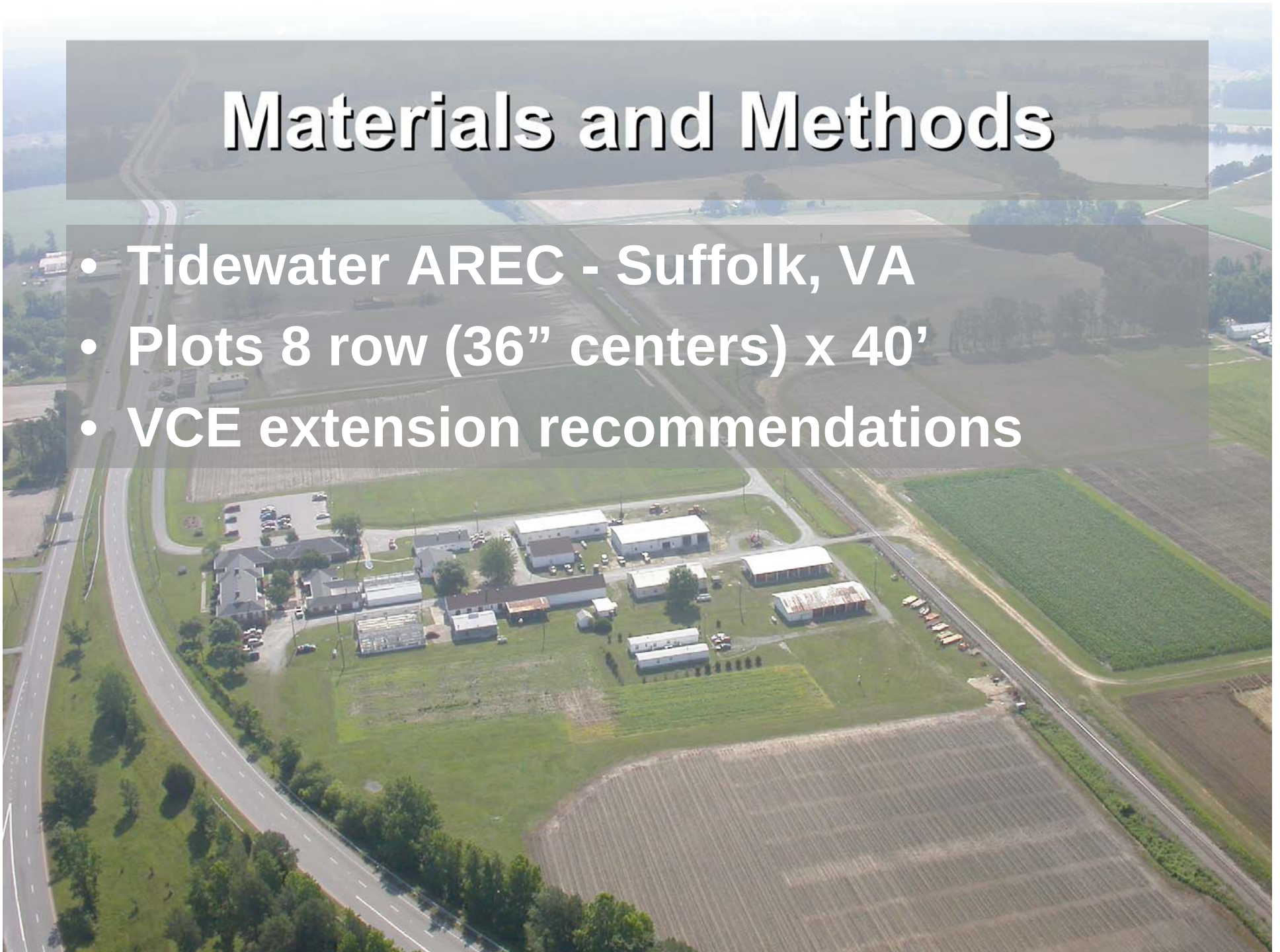
1. Quantify changes in soil quality parameters in traditional and sod based cropping sequences
2. Examine changes in pathogen and nematode populations in traditional and sod based cropping sequences
3. 2006- Examine cotton growth, development and yield response influenced by cropping sequences

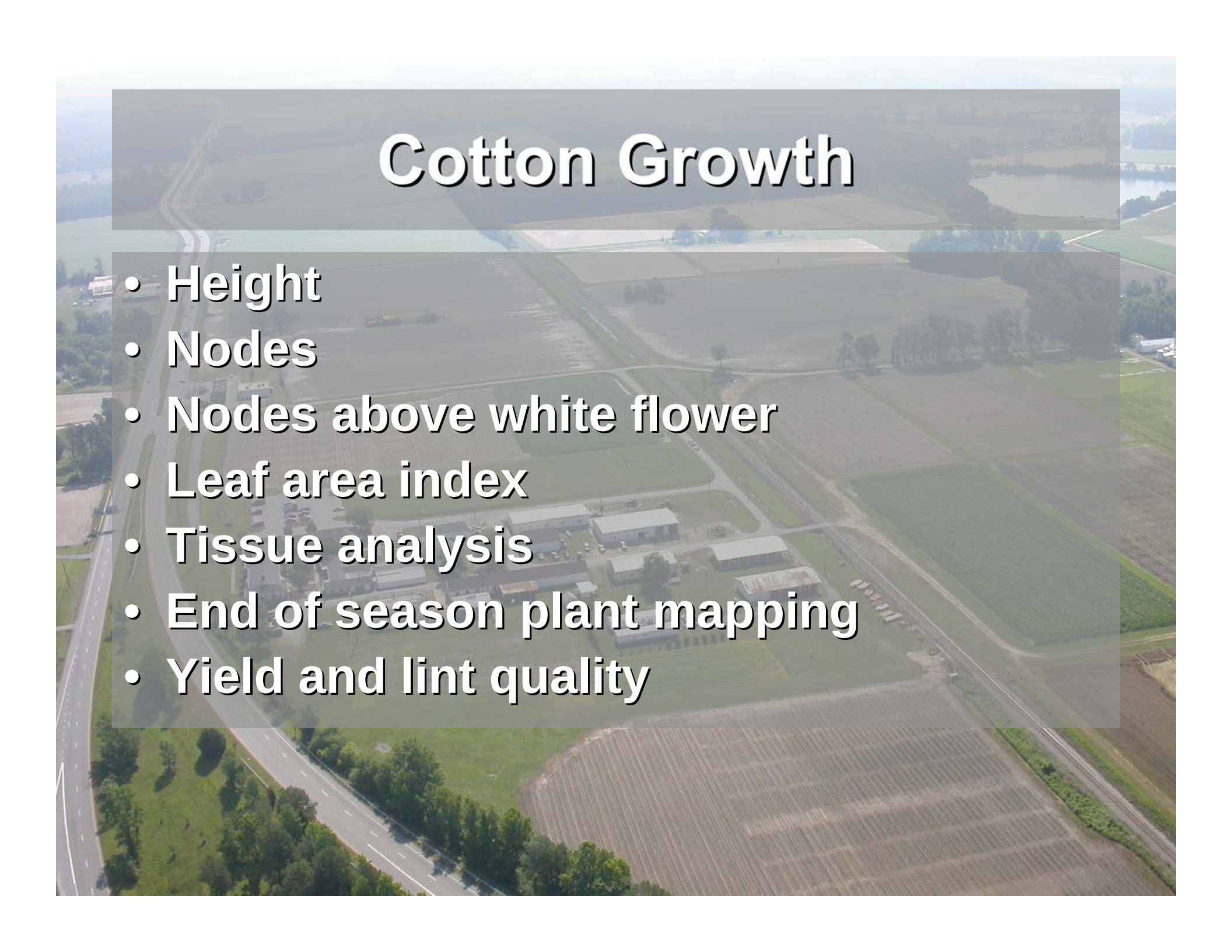
Treatments

Rotation	2003	2004	2005	2006	2007
1	Peanut	Cotton	Cotton	Cotton	Cotton
2	Peanut	Cotton	Corn	Cotton	Peanut
3	Peanut	Cotton	Peanut	Cotton	Peanut
4	Peanut	Tall fescue	Tall fescue	Cotton	Peanut
5	Peanut	Orchardgrass	Orchardgrass	Cotton	Peanut
6	Peanut	Tall fescue	Tall fescue	Tall fescue	Peanut
7	Peanut	Orchardgrass	Orchardgrass	Orchardgrass	Peanut
8	Peanut	Soybean	Cotton	Cotton	Peanut

Materials and Methods

- Tidewater AREC - Suffolk, VA
- Plots 8 row (36" centers) x 40'
- VCE extension recommendations



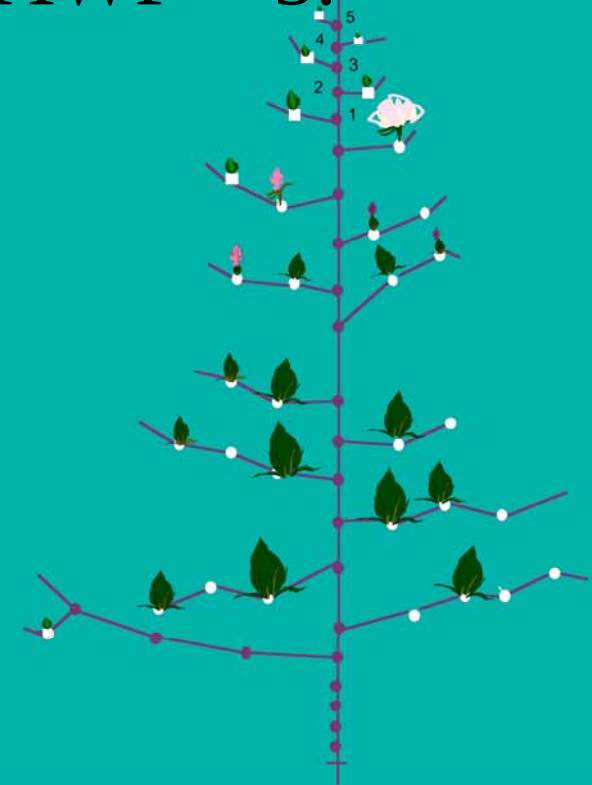
An aerial photograph of a rural landscape, likely a cotton farm. The image shows large, rectangular agricultural fields, some of which are green and others brown, indicating different stages of crop growth or harvest. A winding road runs through the lower left portion of the image. In the center, there is a cluster of farm buildings, including several large, low-profile structures. To the right, a small pond or reservoir is visible, surrounded by trees. The overall scene is a typical representation of a large-scale agricultural operation.

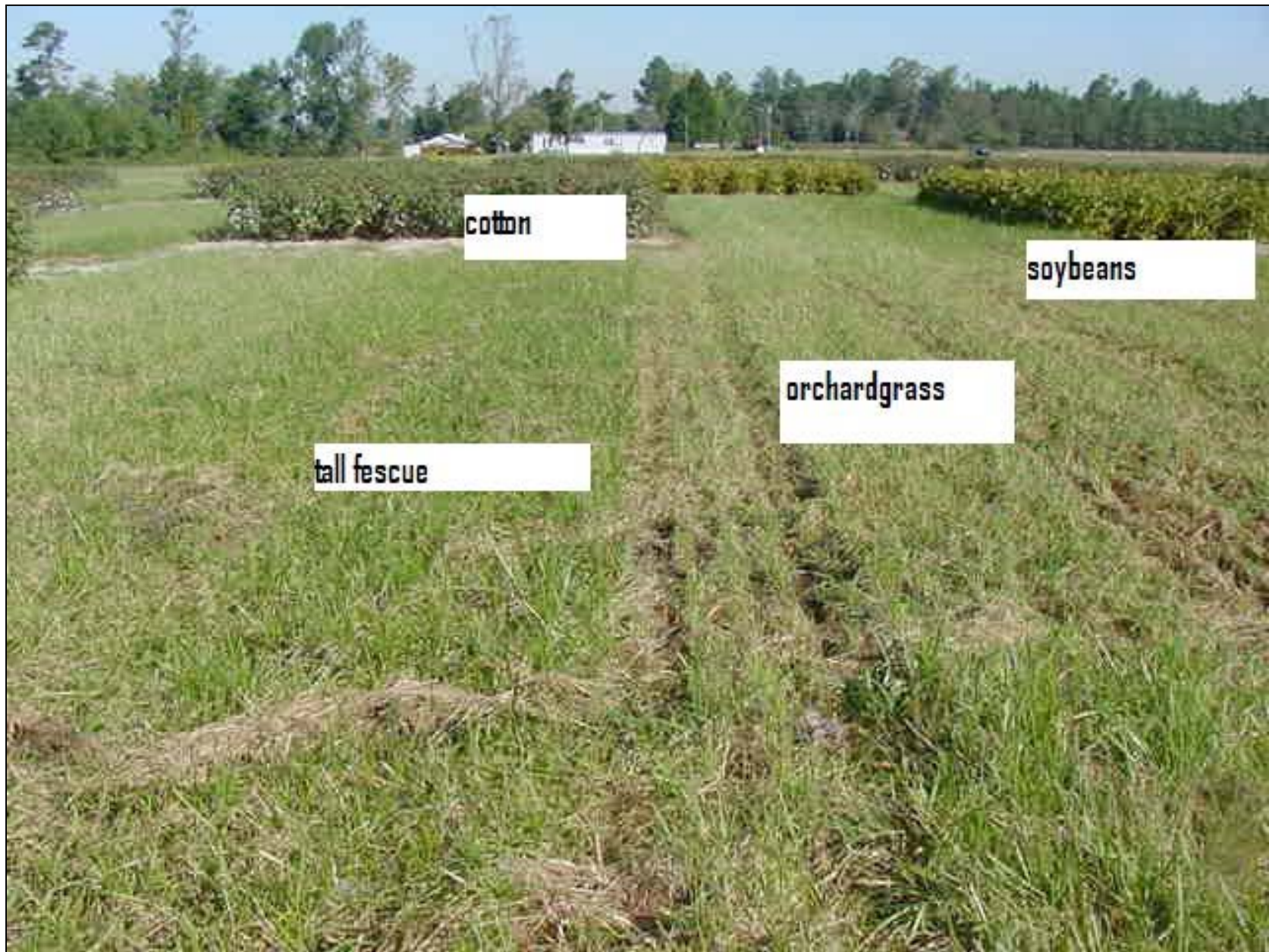
Cotton Growth

- Height
- Nodes
- Nodes above white flower
- Leaf area index
- Tissue analysis
- End of season plant mapping
- Yield and lint quality

Nodes Above White Flower

➤ Last effective boll population occurs at NAWF = 5.





October 2004



April 2005



May 2006





June 2006

2006

F-F-Ct

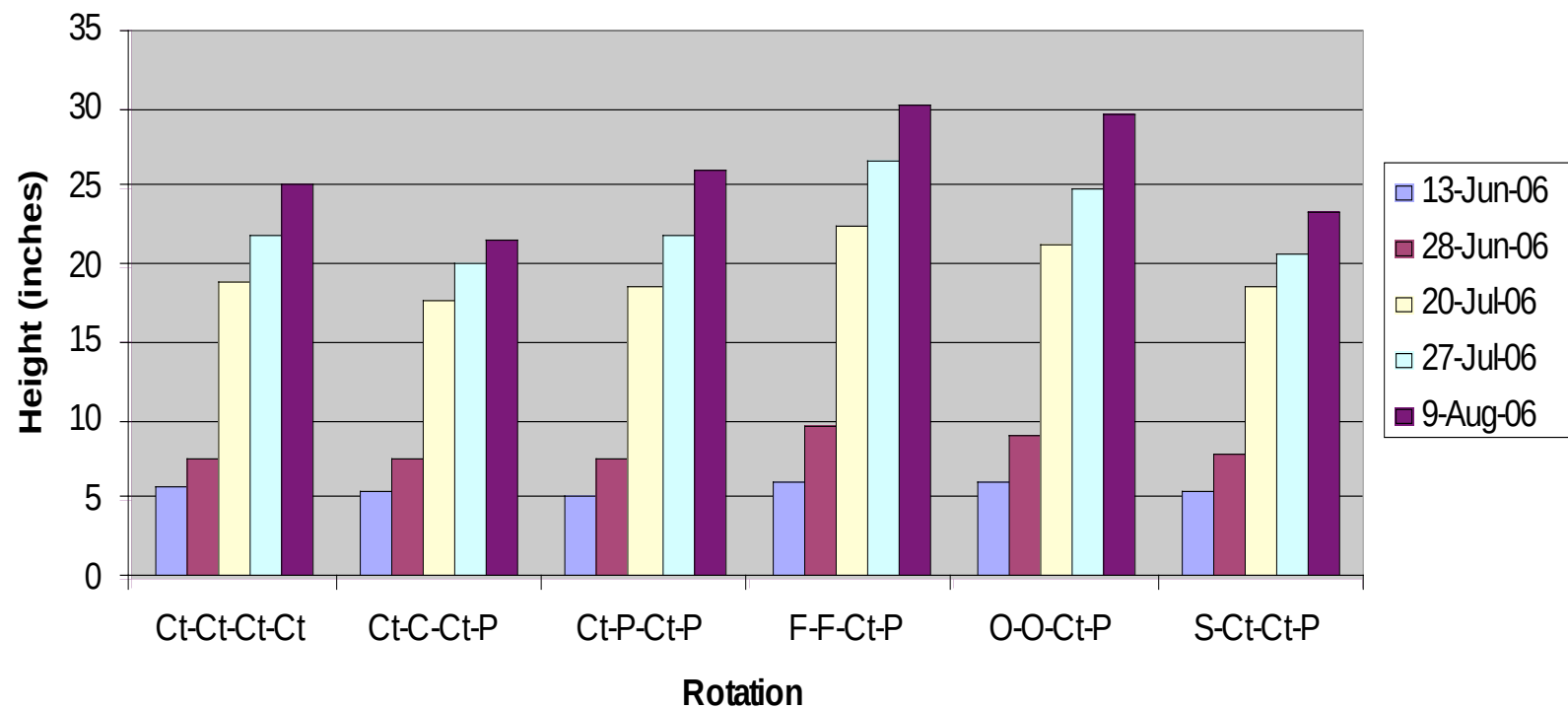


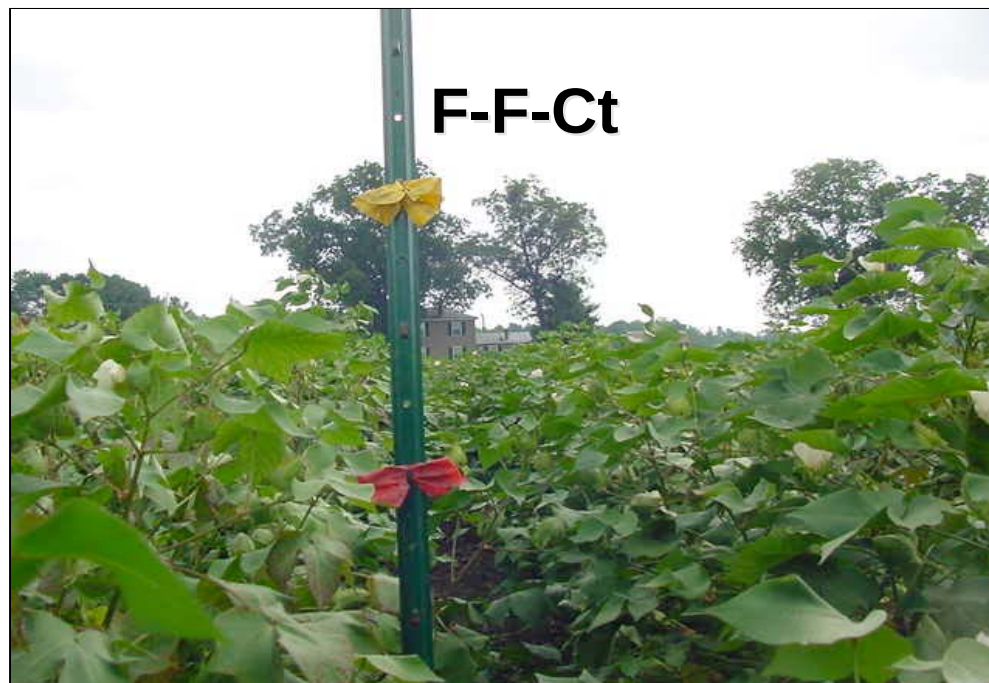
S-Ct-Ct



Plant Height

Cotton Heights 2006

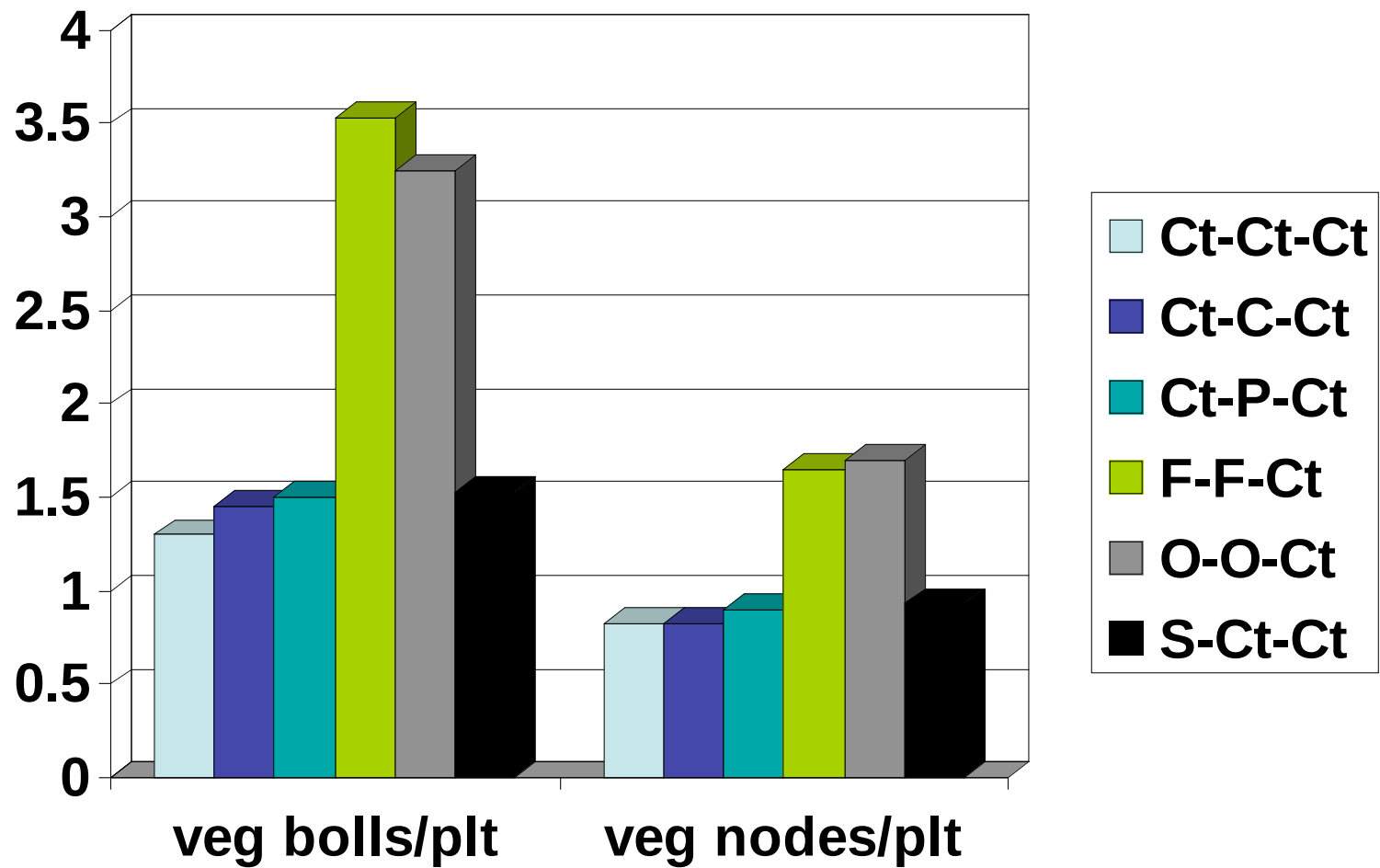




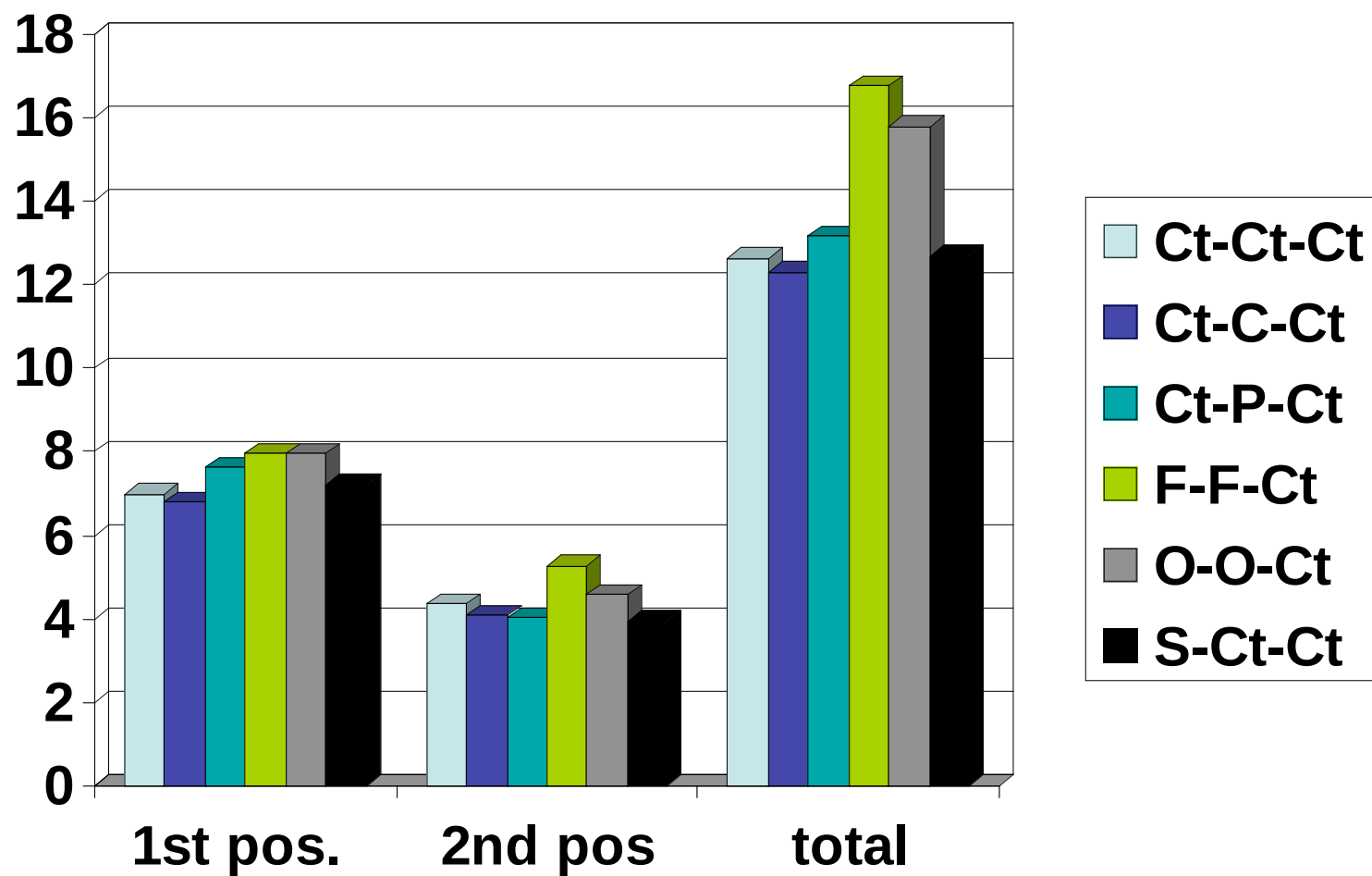
Nodes, Leaf Area Index and NAWF

	Avg. Nodes per plant			LAI	Nodes Above White Flower	
Treatment	28-Jun-06	27-Jul-06	9-Aug-06	18-Aug-06	27-Jul-06	9-Aug-06
Ct-Ct-Ct-Ct	7.1 b	13.7 ab	14.2 b	1.56 bc	6.5 a	3.8 a
Ct-C-Ct-P	7.2 b	13.2 b	13.2 c	1.20 c	6.1a	3.4 a
Ct-P-Ct-P	7.3 b	13.1 b	14.3 ab	1.84 abc	6.4 a	4.0 a
F-F-Ct-P	8.1 a	14.3 a	15.3 a	2.20 a	6.4 a	4.8 a
O-O-Ct-P	7.4 b	14 a	14.7 ab	1.97 ab	6.5 a	4.1 a
S-Ct-Ct-P	7.1 b	13.1 b	13.8 bc	1.35 bc	6.1 a	3.5 a

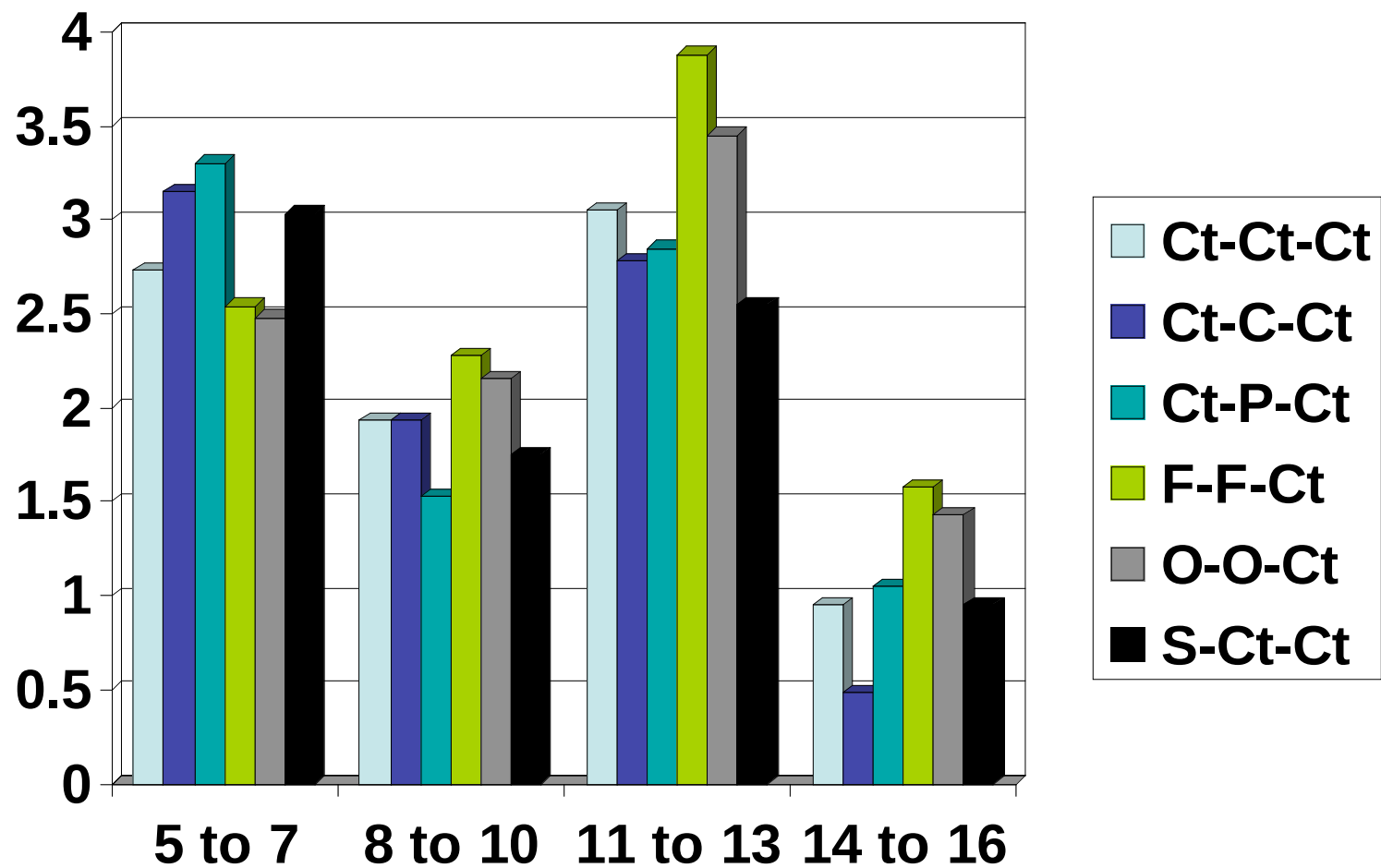
Vegetative



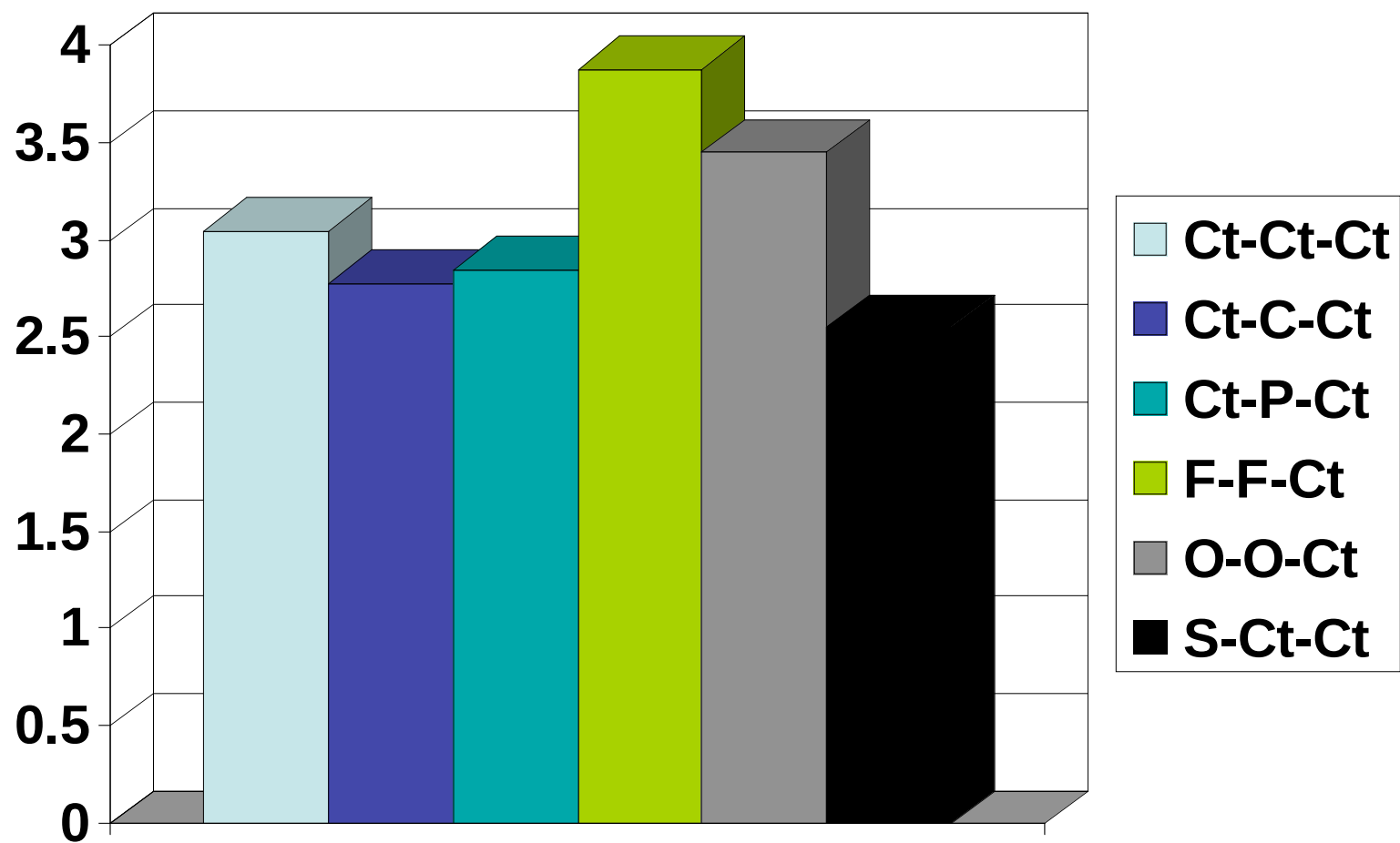
Bolls / plant



Bolls/Plant by Zone



% Retention



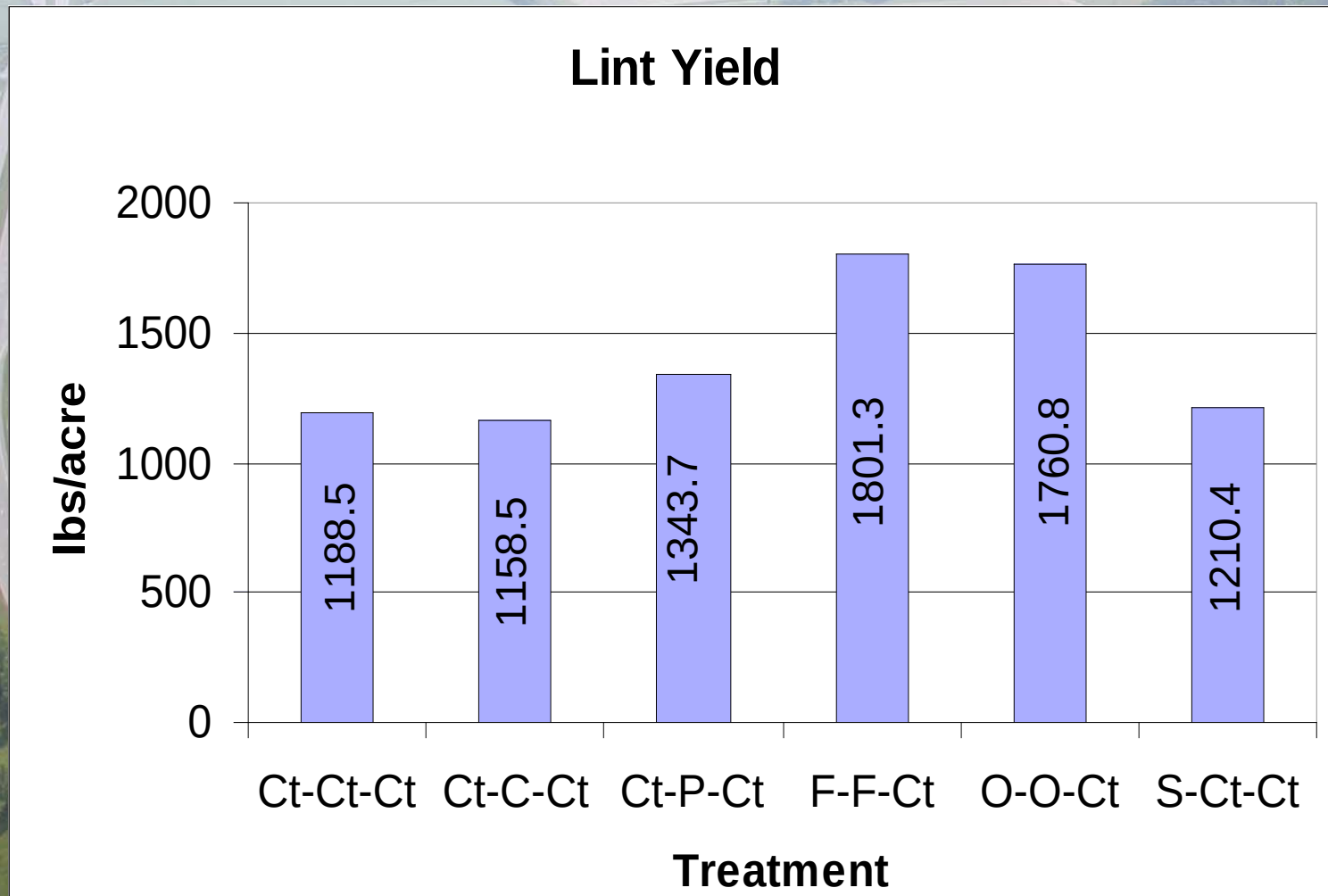
Tissue Nutrient Analysis

	Leaf tissue analysis by %			Petiole tissue analysis by %		
Treatment	sulfur	phosphorous	potassium	sulfur	phosphorous	potassium
Ct-Ct-Ct	0.608 ab	0.325 bc	2.175 a	0.240 a	0.275 bc	6.663 a
Ct-C-Ct	0.378 c	0.353 bc	2.035 a	0.125 b	0.263 bc	5.003 a
Ct-P-Ct	0.730 a	0.318 c	1.895 ab	0.240 a	0.243 c	6.045 a
F-F-Ct	0.670 a	0.440 a	1.540 c	0.260 a	0.390 a	5.985 a
O-O-Ct	0.655 a	0.378 b	1.715 bc	0.235 a	0.325 ab	6.705 a
S-Ct-Ct	0.468 bc	0.300 c	2.035 a	0.158 b	0.210 c	5.875 a

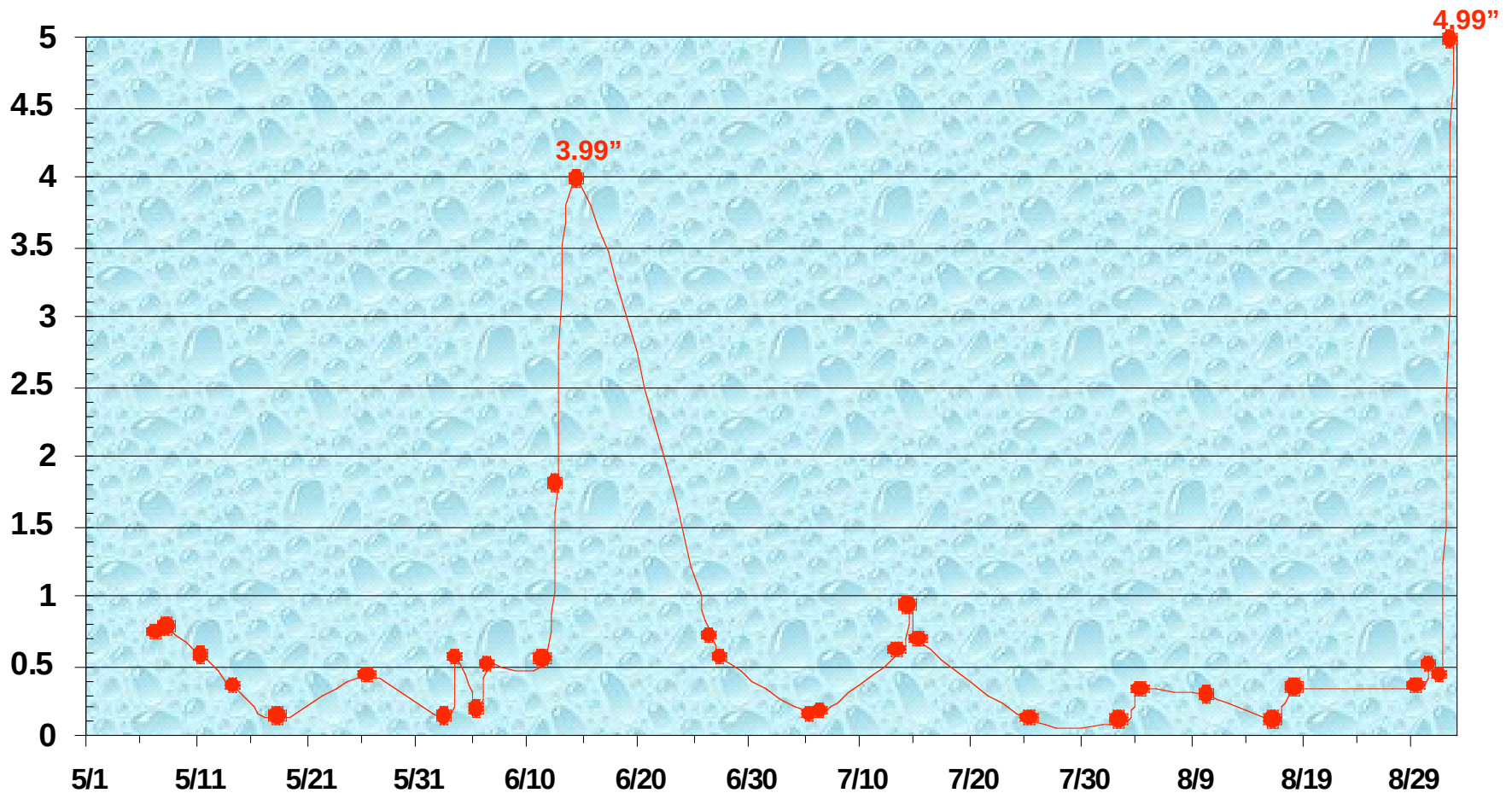
No significant differences between % nitrogen, magnesium, calcium or sodium in leaf or petiole

Fisher's Protected LSD, $P \leq 0.05$ level

YIELD!!!



Seasonal Rainfall, May 1 –September 1, 2006



Accumulated rainfall as of Sept. 1 = 22.40"



Peanuts 2007

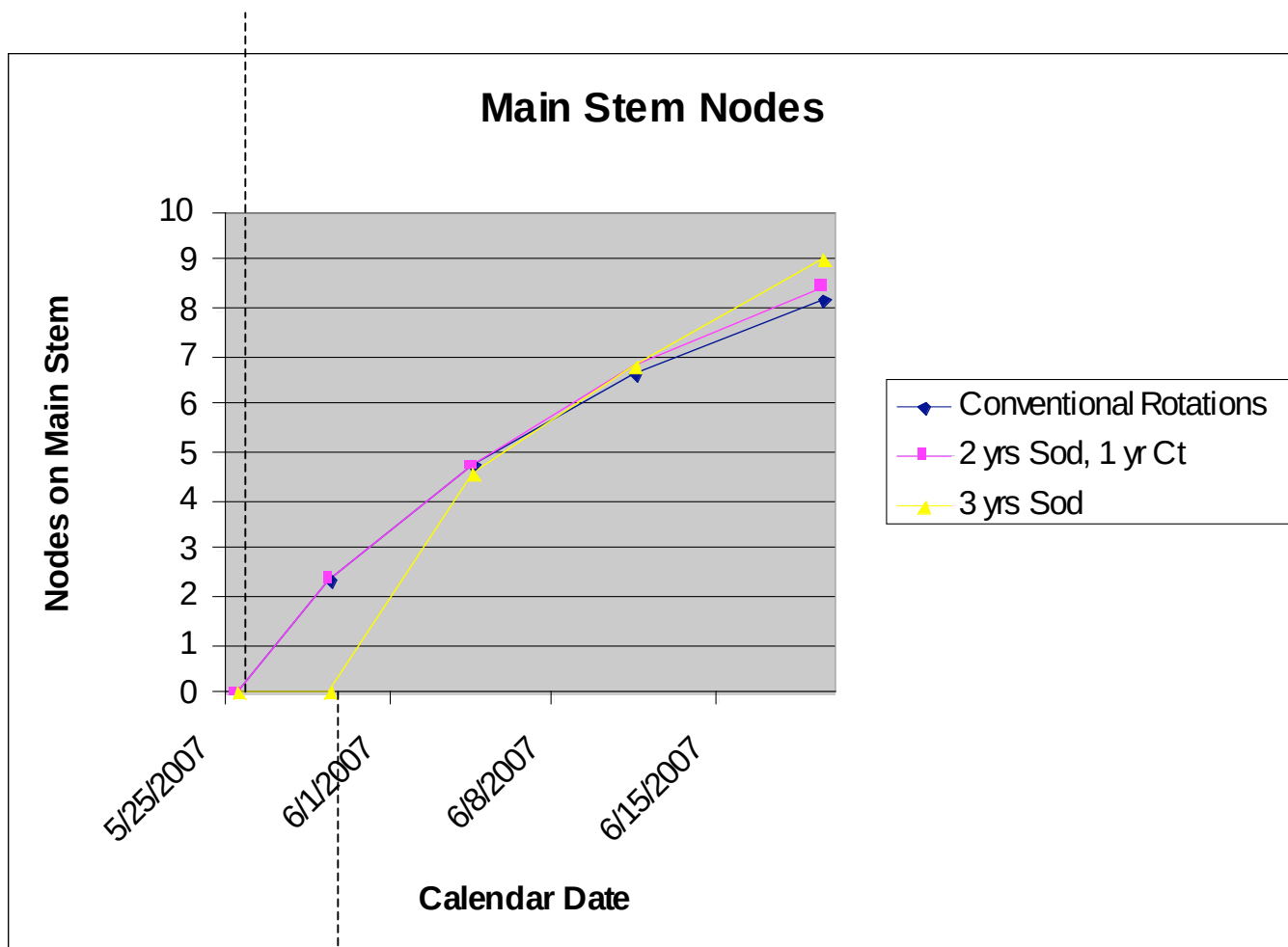


Growth
Stage V8

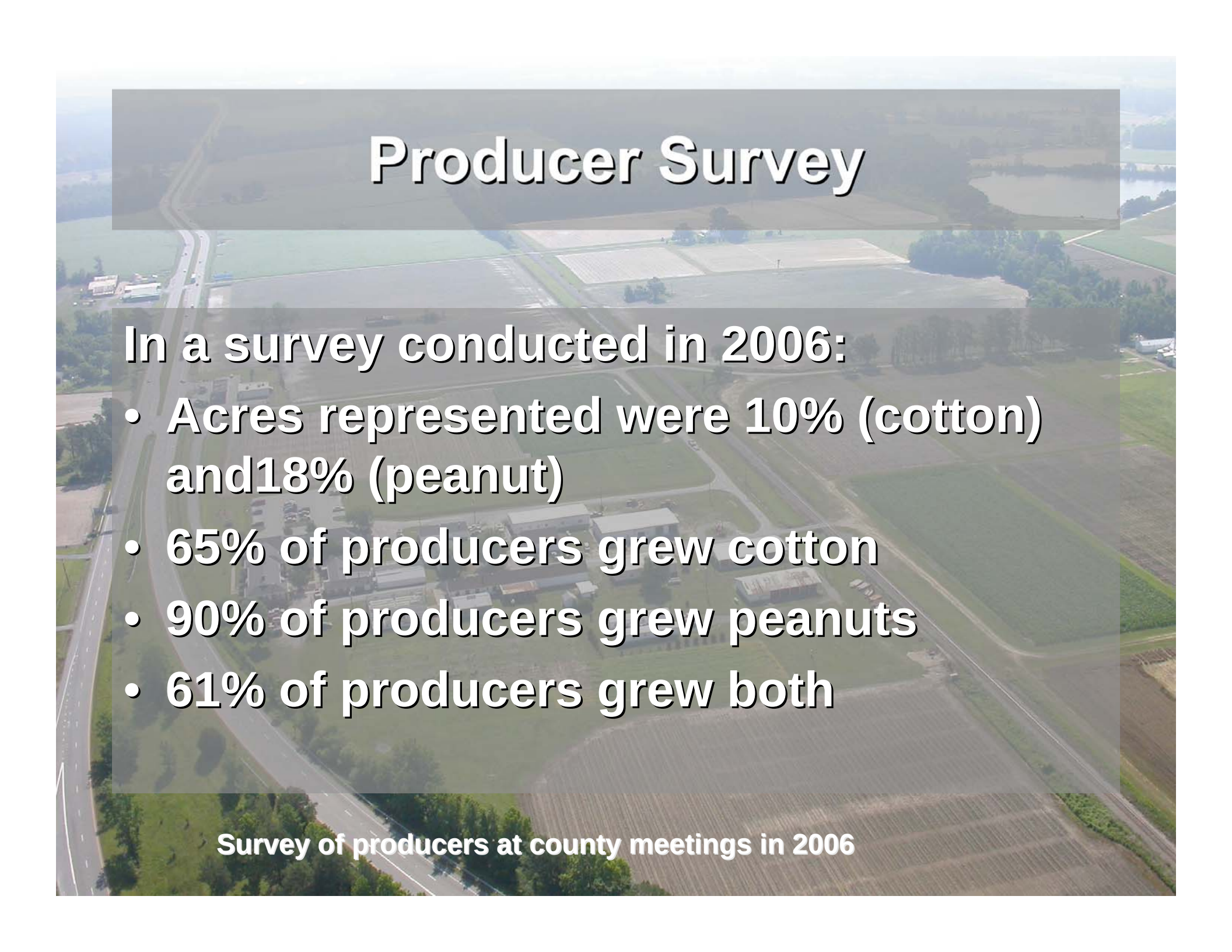


Cotyledon Branches,
Node 0

**Conventional and 2 yr sod + 1 yr
cotton cracking/emergence.**



**3 yr sod cracking/emergence 4
days after other rotations.**

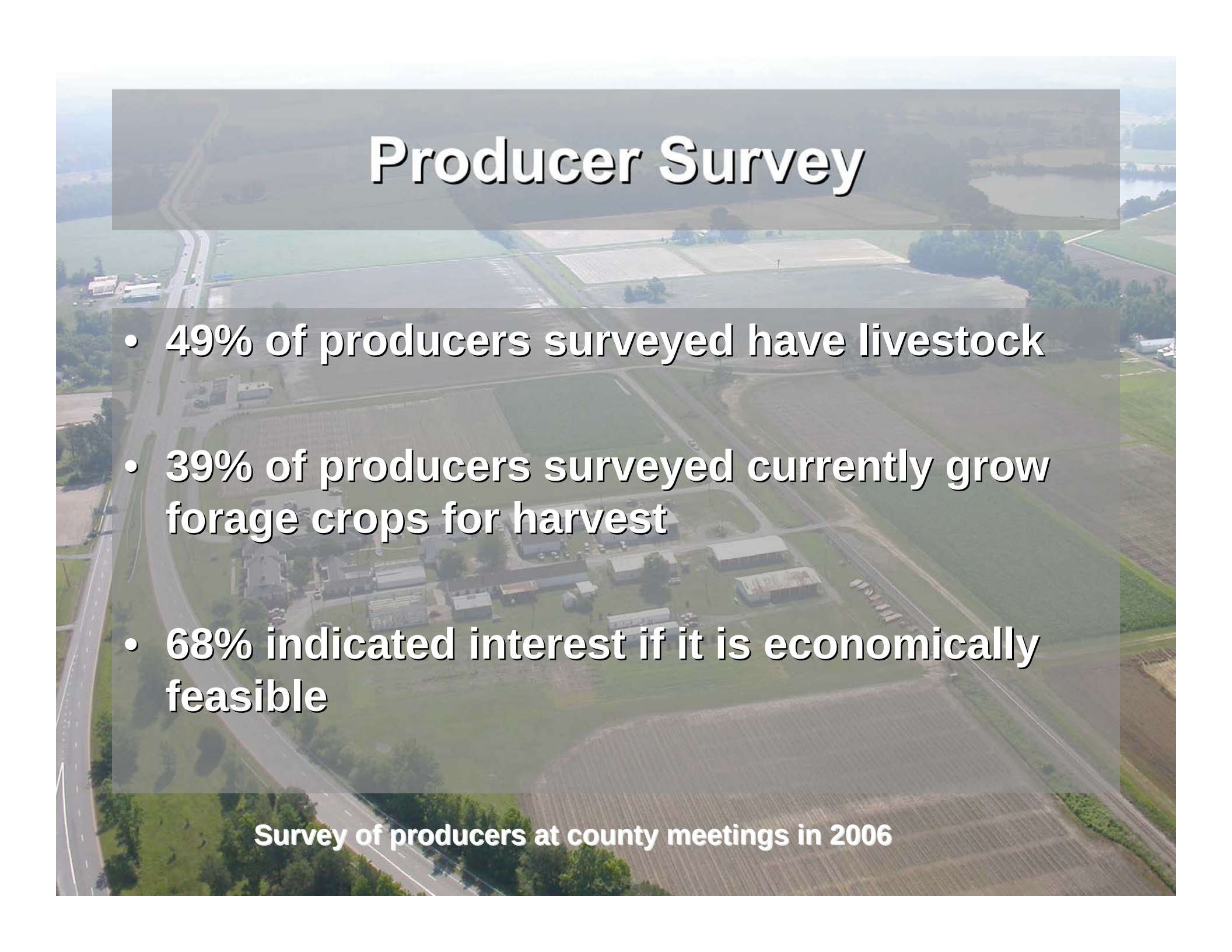
An aerial photograph of a rural landscape. In the foreground, there's a paved road with a white dashed line. To the right of the road is a large, dark, rectangular pond. Beyond the pond, there are several large, rectangular fields, some of which appear to be covered in a light-colored material, possibly plastic mulch or a different crop. In the background, there are more fields, a line of trees, and a small body of water. The sky is overcast.

Producer Survey

In a survey conducted in 2006:

- **Acres represented were 10% (cotton) and 18% (peanut)**
- **65% of producers grew cotton**
- **90% of producers grew peanuts**
- **61% of producers grew both**

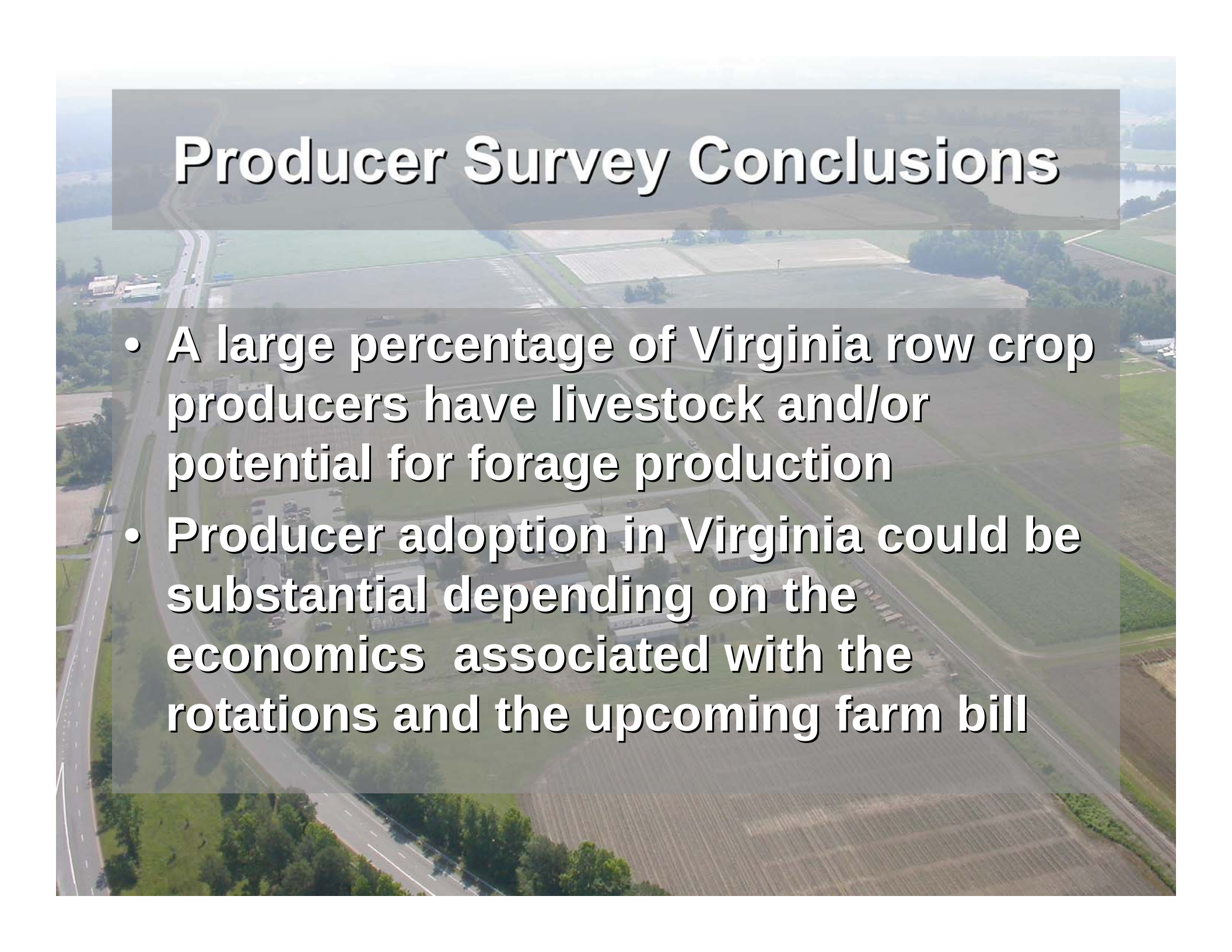
Survey of producers at county meetings in 2006

An aerial photograph of a rural landscape. In the foreground, there's a paved road curving from the bottom left towards the center. To the right of the road is a farmstead with several buildings, including a large barn and smaller structures. Beyond the farm, there are large, flat agricultural fields, some of which appear to be planted with crops. In the background, there's a line of trees and a body of water, possibly a pond or a small lake, under a hazy sky.

Producer Survey

- 49% of producers surveyed have livestock
- 39% of producers surveyed currently grow forage crops for harvest
- 68% indicated interest if it is economically feasible

Survey of producers at county meetings in 2006

An aerial photograph of a rural landscape. A multi-lane road runs diagonally from the bottom left towards the center. To the right of the road, there are several large, rectangular agricultural fields, some of which appear to be planted with crops. In the background, there are more fields, some trees, and a small cluster of buildings, possibly a farmstead. The sky is overcast and hazy.

Producer Survey Conclusions

- A large percentage of Virginia row crop producers have livestock and/or potential for forage production
- Producer adoption in Virginia could be substantial depending on the economics associated with the rotations and the upcoming farm bill

Conclusions

Incorporating perennial grasses into traditional row cropping sequenced can result in:

- 1) increased % boll retention, total bolls/plt, fruiting nodes/plt, vegetative nodes/plt, and vegetative bolls/plt.**
- 2) increased yield**
 - Yield enhancement may be magnified by lack of rainfall

Perennial grasses may be useful for moving into conservation tillage management plans

An aerial photograph of a rural landscape. In the foreground, there's a paved road with white dashed lines. To the right of the road is a large, dark, rectangular pond. Further back, there are several large, light-colored rectangular fields, some of which appear to be under construction or recently cleared. In the background, there are more fields, some with trees, and a small cluster of buildings. The sky is overcast and grey.

Future Goals

- Peanuts in 2007
- Further understand the underlying causes of the enhanced cotton growth and development following perennial grasses observed in 2006
- Secure funding
- Large on-farm research
- Continue small plot research

Acknowledgements

- Virginia Cotton Board
- Cotton Incorporated
- Virginia Peanut Board
- Virginia Agricultural Council
- Mike Weeks
 - 3:50 – Plant Responses to Rotation and Conservation Cropping Systems



Welder

Fuel Tank Repair

Why Women Live Longer Than Men!