



Cotton Lint Yield, Fiber Quality, and Water-Use Efficiency as Influenced By Cultivar and Irrigation Level

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Introduction

Cotton is produced in the Texas High Plains under a wide range of water levels, ranging from dryland to full irrigation. Irrigated cotton is grown under varying levels of deficit irrigation depending on well capacities. With declining well capacities, it is important to maximize water-use efficiency by crop management and cultivar selection. Field studies were conducted in 2011 to evaluate new cultivars under varying irrigation inputs at the AG-CARES research farm near Lamesa, TX and Texas Agrilife Research and Extension Center at Lubbock.

Objectives

Determine lint yield, fiber quality, and water-use efficiency as influenced by cultivar and irrigation level at two locations with different soil textures and well capacities.

Material and Methods

- Randomized complete block design with three replications

Lamesa

- Pivot – Low Energy Precision Application
- Planted May 27
- Harvested November 10
- Plots 4 rows x 95 feet

Lubbock

- Subsurface Drip Irrigation
- Planted May 9
- Harvested September 30
- Plots 4 Rows x 70 feet

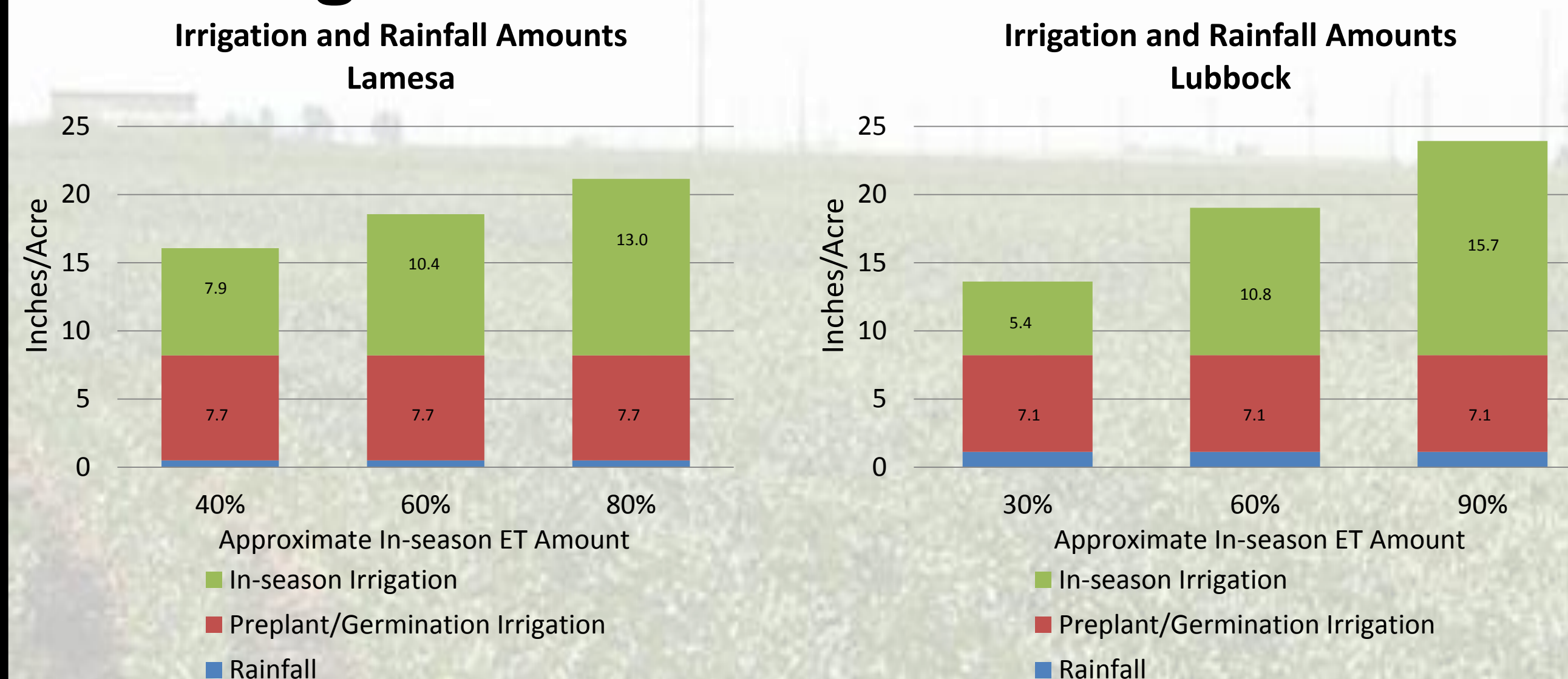
Target Irrigation Levels: Irrigation Applied (in.)

- Lubbock:
- 90% In-season ET Replacement - 15.7
 - 60% In-season ET Replacement - 10.8
 - 30% In-season ET Replacement - 5.4
- Lamesa
- 80% In-season ET Replacement - 13.0
 - 60% In-season ET Replacement - 10.4
 - 40% In-season ET Replacement - 7.9

Varieties:

- 11R110B2R2
- 11R112B2R2
- 11R159B2R2
- 10R011B2R2
- 10R013B2R2
- DP 1032 B2RF
- DP 1044 B2RF
- DP 0912 B2RF

Irrigation and Rainfall Amounts



Results - Lamesa

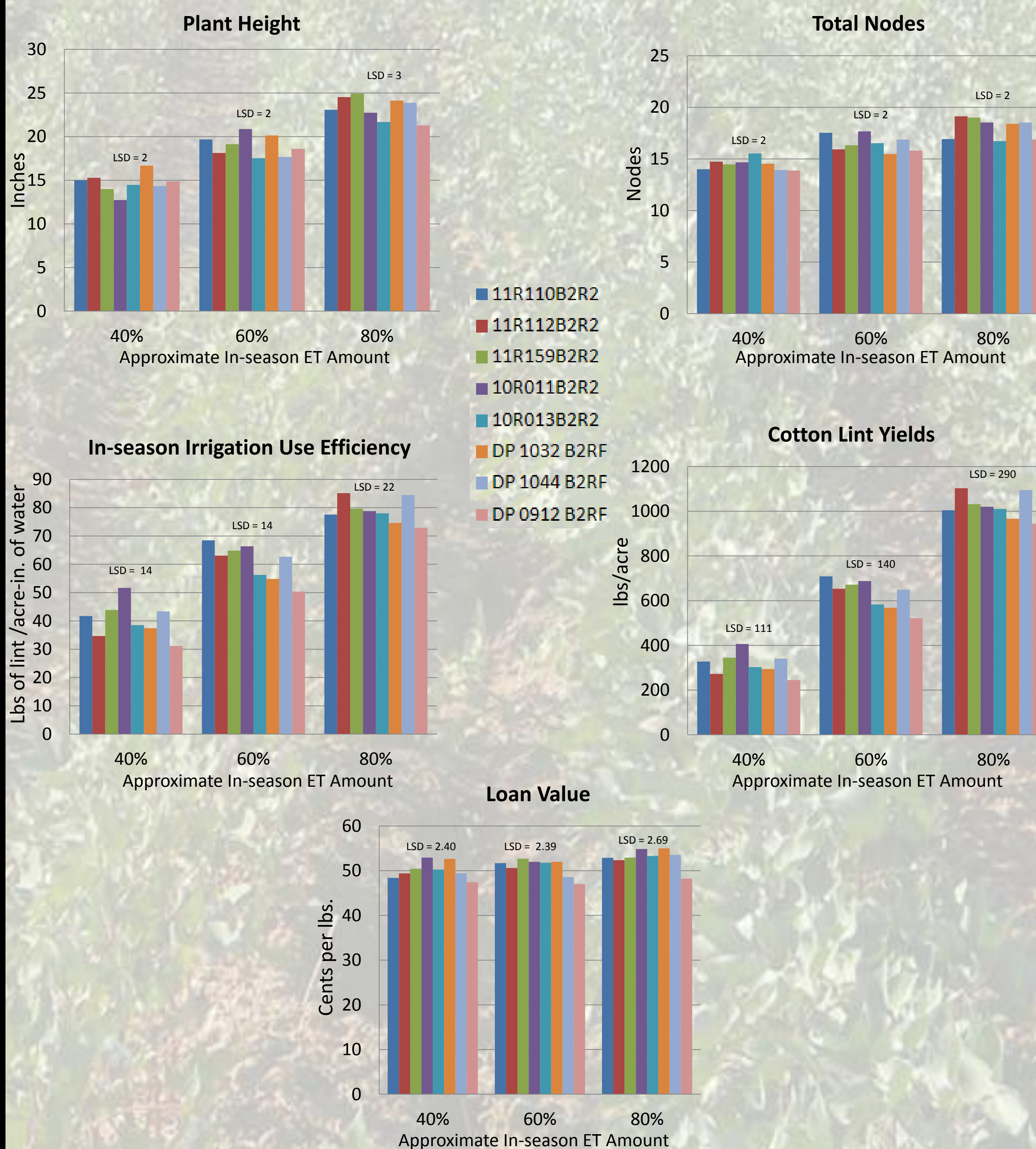
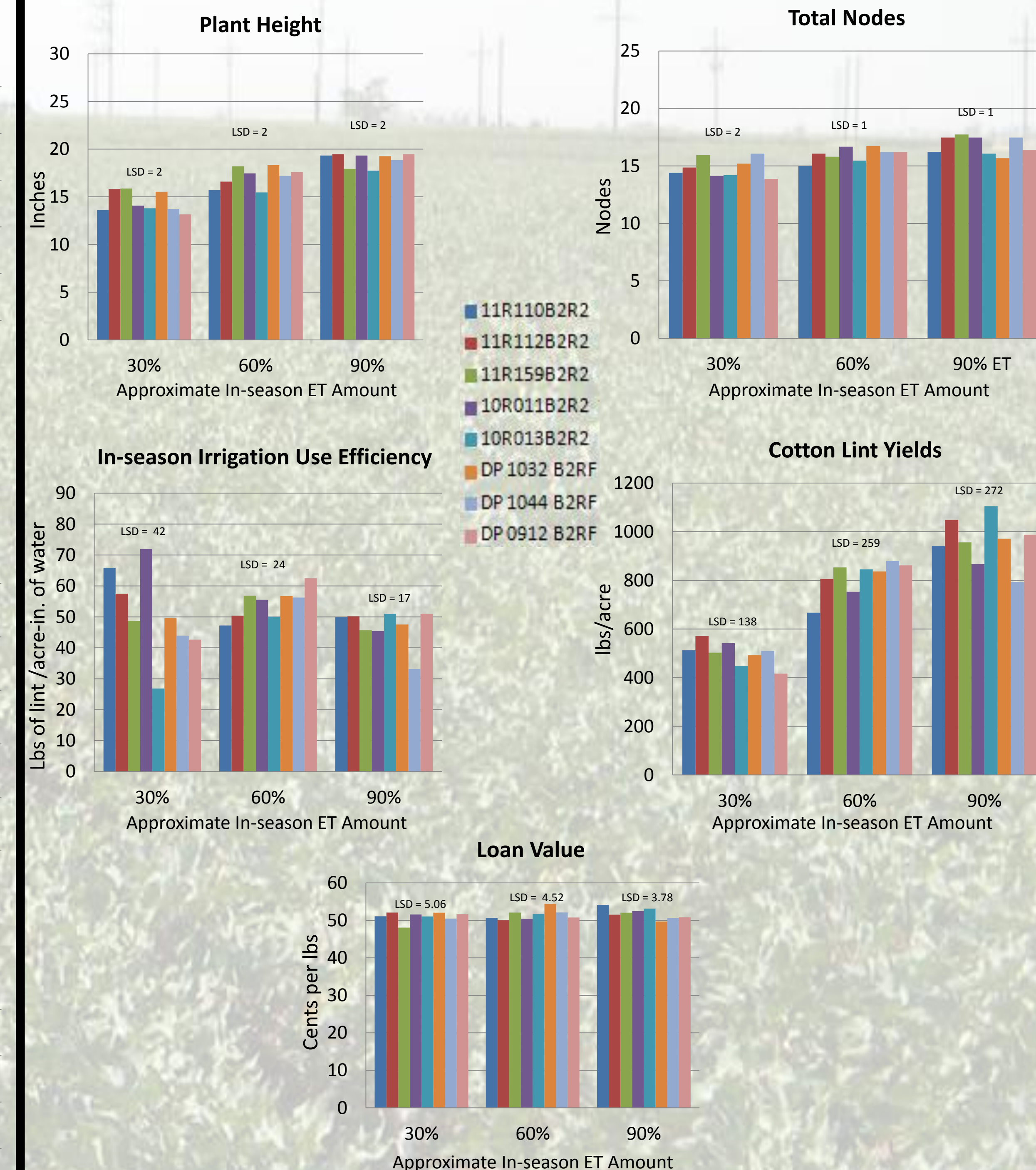


Figure 1 – Subsurface drip field at Lubbock



Figure 2 – Overhead pivot field at Lamesa

Results - Lubbock



Summary

- Due to almost no rainfall and record high temperatures, irrigation requirements were well above average at both locations. Yields and fiber quality (fiber length) were reduced due to the drought as well.
- At Lubbock, lint yields increased as irrigation level increased but in-season WUE was similar across irrigation levels. Yield differences between cultivars were observed at the low and high irrigation levels. Differences in loan value between cultivars were observed only at the high irrigation level. No difference in loan values between irrigation levels was found.
- At Lamesa, lint yields and in-season WUE increased as irrigation level increased. Yield differences between cultivars were observed at low and medium irrigation levels. Loan values increased as irrigation level increased. Differences in loan values between varieties were observed within each irrigation level.
- Trials will be repeated at the same locations in 2012.