

Longacres gas conversion

By Stuart Bray¹

ling 955 mm compared with 799 mm for the 2007–08 season.

Lint yields and fibre quality

The deficits achieved at maximum soil water extraction are shown in Figure 2 with their yields. The yields were significantly different in both seasons as was the response to deficit. Lint yield was less sensitive to deficit in 2007–08 when evaporative demand was lower.

The lint yield when irrigating at a 39 mm deficit in 2007–08 was significantly lower than for the 58 mm deficit and could be attributed to slight water logging as rain coincided with irrigation on five of the 10 irrigation events.

It is also clear the yield of Bollgard II responded to frequent irrigation when evaporative demand is high as occurred in 2006–07.

The increase in yield from irrigating at smaller deficits during flowering came from fruiting sites grown after flowering (Table 2). That is, P1 and P2 bolls nearer the top of the plant and vegetative branch bolls. So for Bollgard II plants, balanced growth was achieved because higher water availability ensured vegetative growth was not suppressed in preference to boll growth as would occur during water stress.

Deficit significantly affected fibre quality parameters in both seasons (Table 3). In 2006–07 only the largest deficit (124 mm) impacted on length and strength. Micronaire increased as deficit increased and may be explained by high boll loads as water availability increased. In 2007–08 only micronaire was reduced using a 54 mm deficit.

FUTURE WORK

Information that can permit scheduling of irrigation that incorporates available soil water and evaporative demand is a key goal. We also hope to gain a better understanding of how partitioning of growth between bolls, leaves and stems interacts with water availability.

This knowledge could be used in the future to balance growth using water. This experiment has been repeated in 2008–09 and water balances for the three seasons will be calculated in the near future.

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¹CSIRO Plant Industry, ACRI, Narrabri and Cotton Catchment Communities CRC.

The irrigation farm 'Longacres' on the banks of the Mooki, near Gunnedah, is in the process of converting their engines from diesel to diesel-gas. Its under trial now on one of their pumping engines. The manager, Tim Leo, said if it works out he will incorporate gas substitution to another five pumps.

Elgas supplies the gas to the farm, and then it is mixed with the diesel on site into the six cylinder turbo charged Perkins Phaser diesel. Although the price of diesel has dropped dramatically in the past six months, farmers are sceptical that it will stay at these levels for long. People like Tim Leo believe to make profits in today's climate they need to look at ways of reducing costs.

Diesel substitution is one way of doing this. By mixing small amounts of liquid petroleum gas with the diesel, the motor runs more efficiently. DieselGas Technologies, who do the conversions, suggest that the burn rate goes from 75 per cent to 98 per cent, while the motor runs better and needs less diesel to maintain its load. The reduction in diesel costs is around 30 per cent. This is acceptable now, but even more enticing when diesel revisits the 170 cents a litre level.

Tim Leo regards his ground water as a precious resource, and because it's the most expensive water to use, is always pumped last and sparingly with the most

efficient use of energy to get it above ground. This is the reason for the interest in diesel substitution and/or any other system that will reduce pumping costs.

There are always expenses to improve a situation, and the conversion that needs to be done to the motor at current costs is approximately \$9000 depending on the degree of difficulty with the conversion. The savings can be paid back in one season on a 300 HP motor according to Matt Derrig, director of DieselGas Technologies.

DieselGas Technologies have completed 40 gas conversions in northwest NSW during the last two years. This was during the peak of the fuel crisis. But farmers and businesses are still concerned that once the economic crisis is over, fuel prices will soar again. At conversion, the motor is given a full assessment to check that it is running at the correct speed. Several cases have occurred where the motor was over worked and adjusted to optimise its performance. In some cases this has increased fuel efficiency by up to 50 per cent.

High fuel prices are not the only reason companies are converting to diesel-gas. Large corporations are looking at the conversion as a way of minimising their carbon footprint. Nitrous oxide or NOx is a targeted emission and it can be reduced by up to 20 per cent through this process.

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Matt Derrig, Director DieselGas Technologies, conducting a gas conversion at 'Longacres' Gunnedah.