

RAINFED COTTON SYSTEMS: ROW CONFIGURATIONS, PLANTING AND ROTATIONS.

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Rainfed or dryland cotton grown in the 550 to 600 mm. per year rainfall regions of northern N.S.W. and southern Qld. is a profitable summer crop alternative. The rainfall distribution tends to be slightly summer dominant while suitable soil has plant available water capacity of 100 to 140 mm. of water.

The variability of in crop rainfall especially during late December and January co-incides with the maximum water needs of the crop, thus good sub-soil moisture is essential to reduce the risk of crop failure. In addition, soil surface in the crop needs to be rough with open cracks, or have a stubble cover to capture high intensity rain especially on sloping areas.

Row configurations and Planting Density

As average yields are 2.5 b/ha. single skip has become the dominant row spacing. However, increasing discounts for immature fibre often in conjunction with lower yields make double skip look more attractive.

The wider the row spacing the more susceptible the crop is to poor plant stand and the smaller the planting window. Double skip needs to be planted by mid-November as compared to mid-December for single skip. Techniques such as seed soaking and water injection are useful to ensure an adequate plant establishment. Care needs to be taken with seed soaking not to damage soft seeds and not to allow seed to heat up before being placed in the soil. This technique seems to work best when soil temperatures remain above 18 or 20 C. Water injection is very effective provided care is taken not to over-press soil around the

seed. As a rule of thumb the soil should be easily removed with fingers from above the seed some 10 hours after planting on scrub soils.

Erosion by wind and high intensity rainfall are hazards that arise from planting wide rows on profiles full of moisture. The most successful technique to combat these hazards is zero-tilled cereal stubble as a residue that covers 30% or more of the surface. Zero-tilled stubble completely eliminates wind erosion and generally eliminates 90% of water erosion.

Plant density of 6 to 8 plants per metre evenly distributed within the row is ideal. However, this plant population can be too high in single skip in a hot, dry season - especially if there is no significant January rain. Double skip row relies more heavily on an even plant population to use available moisture and is more likely to produce mature fibre in low yielding seasons.

Rotation Crops and Weed Control

Cotton planted into zero-tilled cereal stubble has generally produced the best results in this region. However, by the time the crop has been harvested, little remains. Barley or wheat can be planted into the standing cotton stalks on winter rain as an opportunity crop. The cotton stalks are then slashed in crop or in some cases after a light crop, left for the header to handle. A crop of skiff barley yielding 1.5 t/ha. gives enough residue to allow successful zero-till in the next fallow. In dry seasons a second cereal crop the following winter is necessary to allow build-up in deep sub-soil moisture below one metre, and provide good stubble for the long fallow to cotton. If nitrogen is required it is drilled into the stubble in one metre rows using the summer crop planter. This causes very little disturbance of the stubble and when carried out six months before the cotton planting, allows even distribution down the soil profile.

Soils which have been successfully zero-tilled tend not to

require incorporated herbicides. This keeps the crop options open if a planting opportunity does not arise. Mung beans planted into stubble is a late summer planting alternative.

Weed control during the cotton crop and the fallow is essential. The "woolly herbicide" can be a very useful option for those set up to run sheep. However care must be exercised not to destroy the stubble by overgrazing, especially as the straw becomes less durable with age. The best option is being prepared to use herbicide and only rely on sheep to clean up the paddock after a spray.

Regrowth cotton is the hardest weed to control under this system. The most successful technique for control is the use of 24-D during defoliation or post harvest on regrowth. Other methods involve band spraying and the weed detector technology in the following summer, however 24-D cannot be used, which leaves less effective and more expensive alternatives.

Thistles usually appear on near full profiles as a result of winter rain. These must not be allowed to escape and should be sprayed and not grazed as subsequent control becomes extremely difficult.

Conclusion

Maintaining profitability, or more importantly minimizing losses in dry years, has become a major priority. This can only be achieved through good fallow management, correct plant density, timely January rain and varieties which produce greater yields of mature fibre under moisture stress.

Research Priorities

An effective chemical to economically control regrowth cotton.

Varieties which produce more mature fibre with lower water usage.

