RAINGROWN COTTON - THE DIFFERENCES

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Raingrown cotton in Northwest NSW and Southwest Queensland is not grown on metre beds, rarely has aerial applications, relies to a large extent on stored water, uses little or no fertiliser and large areas are harvested with brush strippers. Whilst this production system seems a far cry from its irrigated cousin, the production costs and returns on a per bale basis are similar. Since the early 1980's raingrown cotton has grown from a fledging industry to become established as a reliable dryland summer crop. Dryland cotton producers now possess cotton specific planters, cultivators, spray rigs and harvesters. They have adopted management practices to ensure returns in all but the toughest of seasons. They forward sell cotton using innovative marketing tools. Only a major reduction in the price of cotton or a strong recovery in grain prices will see the expansion of dryland cotton stifled.

Production differences, the problems and their management

Heavy reliance on stored water. Up to 50% of the crops water supply may come from stored moisture - it is the major yield determinant in dry seasons. In deep well structured soils cotton will extract water from 1.5 metres - the aim is to fill the soil profile to this depth. Dryland cotton fields are fallowed for twelve months prior to planting. Fallow management techniques that maximise stored moisture need to be employed. This generally means zero or at least minimal tillage.

Soils this full of water are prone to erosion. The practice of retaining stubble from the previous winter cereal is commonplace. Cotton is planted directly into the stubble to offer some protection from early summer storms until the crop is well enough established to give its own protection.

Planting date is extremely variable, determined largely by the opening spring rains. The 15th December has become largely accepted as the last planting date. Late plantings particularly after this date are prone to high insecticide costs, dry autumn finishes and early frosts.

Skip row configurations are commonplace. Two rows planted on one metre centres then a two metre skip is the most prevalent row spacing. This reduces production costs substantially whilst having a minimal effect on yield. Containment of costs needs to be pursued season long. Given several options the easiest management decision is generally the most expensive.

Planting must be executed as quickly as possible as planting conditions deteriorate rapidly, especially in November. Stubble retention, water injection, seed priming and soil removal in front of the planting tyne are all useful means of extending a planting opportunity. Careful inspection of soil conditions is necessary to ensure there are no dry bands under moist top soil. Planting under these conditions will result in death of the plants tap root and the development of what is known as "club root". Plants with club root develop shallow root systems unable to tap deep moisture and are prone to death under extreme dry. Soil borne insects are controlled to ensure plant stands are not lost. This will avoid wasting what may have been the only planting rain of the season. There exists a risk of not planting the crop at all if planting rains are too little or arrive too late.

Early insect control is paramount. Having established the dryland cotton crop subsequent rainfalls may not be forthcoming. Crops suffering early fruit loss in these seasons will not have the opportunity for compensatory growth.

The variety of insects and their level of infestation is no different to that found in irrigated fields. It is not until the dryland crop begins to suffer the effects of moisture stress that insect numbers abate. A skip row crop planted on good moisture will not stress before the second week of flowering. Low insect thresholds are maintained until early flowering. At this stage the crop manager should assess fruit retention and given moisture conditions. Crops with good fruit retention below the ninth fruiting limb will rarely retain fruit above this node through to harvest - insect thresholds on these crops can be relaxed.

Groundrigs are used exclusively with the exception of extended wet periods. This allows economies to be enjoyed in insect control. Advisors need to ensure that correct band width recommendations are being made. An efficient, well maintained groundrig is essential for good timely control of insects, and clean defoliations. Night time operation in the warmer summer months is the only option. Water quality should be examined and adjuvants used if necessary - high pH waters are commonly used resulting in poor insecticide performance. Management of staff becomes difficult as operators need to be available for night shift at short notice. Operator training and safety can never be overdone.

Growth regulants are used strategically. Good moisture and soil fertility results in strong early growth of dryland crops. Growth regulants are an important tool in manipulating plant size to avoid early cutout due to moisture depletion and to tailor the plant to suit brush strippers.

Dryland crops are quite often stressed at defoliation time. Harvest aids such as Dropp and Harvade will perform poorly on these crops. Dessicants such as Sodium and Magnesium Chlorate are the prefered option. Ground rig application affords

the luxury of being able to use large water volumes and good results are generally achieved.

The lower capital and operational costs of brush strippers in crops yielding up to 3.5 bales per hectare has given a significant saving in harvest costs.

Fibre characteristics are often different. Extended periods of moisture stress results in raingrown cotton having a shorter fibre. Micronair is mostly in the premium range or too high. Colour grade is no different.

Suitability of varieties

Longer season varieties perform the best. DP90, L22 and CS189 are the predominant varieties. The long season characteristic seems to impart better root development allowing good moisture extraction. Slower development keeps the plant actively growing for a greater time period increasing the likelihood of receiving beneficial rain. Short season storm proof stripper styles of cotton similar to those used in the USA do not perform well in Australia. Fortunately the varieties being developed for long season irrigated regions seem also to be best suited to dryland regions.

Dryland growers require a variety that maintains good length under moisture stress - L22 is moving in the right direction. A secondary requirement is for a variety that maintains a micronair in the premium range under different conditions - micronair of dryland crops can often be too high. A variety that hangs on longer under moisture stress before cutting out would stand a better chance of picking up beneficial rain.

Research needs

1. Varietal development for a longer fibre and delayed cutout under moisture stress.
2. Does dryland cotton have specific nutritional requirements?
3. Adjuvants that improve water quality and/or the performance of EC formulations.
4. Modification of harvest and handling systems with a view to improved efficiency.
5. The continual development of safer more efficient means of applying chemicals by ground.
6. High capacity planting equipment capable of optimising establishment under variable moisture regimes, planting into heavy stubble residues and with the ability to apply fertilizer.
7. The ongoing development of shielded spraying techniques - to allow for stubble retention early in the cotton season.
8. Weed control without the use of incorporated herbicides.