



COTTON TALES

Central Queensland

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Significant parts of the irrigated areas of CQ will be being planted to cotton immediately following chickpeas or wheat this season. How this stubble is managed will have an effect on the next crop.

Chickpea Affect on Cotton Seedling Growth:

- Growing cotton following chickpea or other legumes with a quick turn around could see an increase in seedling diseases (eg. Rhizoctonia, Pythium).
- While chickpea stubble does breakdown quickly, sowing cotton into freshly incorporated legume residues such as chickpea can produce allelopathic effects (toxic effects to cotton). Decomposing grain is the worst source of allelopathic chemicals. This effect has been found to impact right through to yield and fibre quality (Hulugalle 1998). It is recommended to incorporate legume residues as early as possible to reduce carry over of seedling diseases and other problems. Legume residues left on the surface should be allowed to brown of before sowing cotton.

A note on allelopathy in CQ -Stephen Allen noticed problems with cotton following sorghum in the Emerald region last season. This caused reduced plant stand, slower growth and reduced seedling vigour in several cotton crops following sorghum. *Sorghum residues ideally should be retained on the surface or incorporated well before planting cotton.*

Chickpea Affect on Nitrogen levels:

Chickpea is a legume, and hence fixes nitrogen from the atmosphere. BUT it may be dangerous to assume that the soil will be flush with nitrogen available to young cotton plants as a result.

- The pod filling stage in chickpea places a huge drain on N both within the plant and in the soil. **A lot of the N fixed by chickpea will be removed at harvest, but there can be some input of N from the chickpeas as long as they have been inoculated at sowing, produced effective nodules on their roots & were not water-stressed. Dryland chickpeas added up to 47 kg N/ha (Schwenke et al 1998).**

- When chickpea stubble is incorporated into the soil, the decomposition process starts immediately if there is enough moisture present. The microbial processes involved in decomposition require N, and this may result in there being low levels of N, due to temporary tie-up, following chickpea stubble incorporation and watering.

Wheat Stubble Management

The topical question on wheat stubble is how to manage it for a quick turn around into cotton. In terms of soil health, the ideal is to slash the stubble and plant cotton into it. For more info on this refer to 'Planting Cotton Into Standing Wheat Stubble' on CRC website. As this doesn't suit some operations, other options such as incorporating or burning need to be considered.

Impact on Soil: Frequent & deep tillage operations can rapidly increase the rate of soil organic carbon decomposition & carbon is lost through microbial

breakdown of incorporated stubble. Wheat stubble can cause some seedling diseases.

Impact on nutrients: Wheat stubble is slow to break down & will cause nitrogen tie-up, however has been found to provide a soil environment more conducive to biological activity, resulting in improved N cycling. Burning stubble results in an immediate & large loss of nutrients & impacts on soil biota.

Nutrient	Wheat Stubble Nutrients (kg/tonne of wheat yield)	Nutrient loss during a hot burn (%)
Nitrogen	6	82%
Phosphorus	1	44%
Potassium	44	40%
Sulphur	1	81%
Calcium	3	52%
Magnesium	1	47%
Carbon	480	80%
	<i>Assuming 1t yield = 1.0 tonne stubble</i>	<i>Hot Burn has flames 2m high</i>

A note on burning - CSIRO research indicates that during a bushfire, the temperature at the soil surface varies from 50°–250°C, compared with 50°–150°C in a 'cool moderate' burn. 'Late Burn' also called 'cool burn', refers to stubble that is burnt late, often just prior to planting and is usually a very incomplete burn of the stubble present, allowing machinery to get through very heavy stubble. An ideal cool burn should leave behind sufficient stubble for erosion control and for soil organic matter improvement.

Thanks to Dr Ian Rochester (CSIRO & Cotton CRC) & Dr Nilantha Hulugalle (CSIRO & Cotton CRC) for help with these articles.

Considering Conventional?

- Richard Sequeira's predications for pest pressure in 08/09 are to expect reasonably high local *Heliothis armigera* pressure & secondary pest pressure, due to the abundance of chickpea and wheat crops surrounding the irrigation area, weeds from a wet winter & the cool weather resulting in diapause, with emergence expected throughout October and November. *Heliothis punctigera* pressure is expected to be low to moderate, due to only patchy rain in central Australia.

- Due to the low acreage of conventional cotton being grown, some stocks of chemistry may be low or not available. Contact your local chemical supplier to discuss availability for this season.
- Refer to IRMS for more information.

Plan for Integrated Weed Management (IWM)

Planning & record keeping is an integral part of IWM & reducing the risk of herbicide resistance.

- For each field review what weed controls have been used recently – over winter & last summer
- Plan to use a variety of control methods & herbicide groups.

To prevent herbicide resistance - If you are on to a good thing – DON'T stick with it!