Crown Rot: A Validation of the Commercial Benefits of Inter-row Sowing

Background

Crown rot remains the number one winter cereal disease in the northern grain region. Yield losses in wheat of 50 per cent or more are not uncommon where high disease levels are combined with moisture stress late in the season. The disease crown rot is caused by a stubble-borne pathogen *Fusarium pseudograminearum* (Fp) that survives in cereal or grass weed residues. In a no-till farming system the pathogen is concentrated in the previous cereal rows.

Cryon Trial NGA0608 5/10/2006
Whiteheads are a function of disease level and moisture stress.
Few whiteheads in outside row due to extra moisture

Why look at inter-row sowing?

Research conducted by the UNE showed infection will only occur when the new wheat plant comes in contact with stubble residue that contains the crown rot fungus. Inter-row sowing (sowing between the old cereal rows) can provide a physical separation between the new plant and the infected stubble.

Evaluation by the NSW DPI in 2004 and 2005 showed that inter-row sowing can reduce both the severity of crown rot and incidence of Fp by an average of 45-60%.

Cryon Trial NGA0607 20/7/2006
LHS Between-row sowing NB majority of stubble intact
RHS On-row sowing NB increased disturbance and spread of stubble

In a nutshell

Crown rot severity: *Inter-row sowing reduced disease severity by an average of 53%.*

Grain yield and quality: *Inter-row sowing resulted in an average 5% (101 kg/ha) yield advantage. There was negligible impact on grain quality.*

Economic benefit: *$20/ha net gain over the series of 7 trials at $200/t grain prices.*

Overall: *Effective crown rot management must be based on crop rotation. Inter-row sowing is a useful, but secondary disease management tool. It will provide best benefit when used under low inoculum levels as part of an integrated disease management program. In this situation it will limit the amount of infection and slow the rate of pathogen build-up.*

Inter-row sowing is ***NOT***

- *a crown rot 'circuit breaker' to use when disease levels are out of control.*
- *a strategy that will enable 'back to back' wheat production under increased crown rot risk.*

This work validated the level of disease impact recorded by the NSW DPI in 2004 and 2005. It is important to note that although large average reductions in disease impact were seen, the yield increases recorded were much more modest.