



DAQ500

Extensive dryland pulse development in Queensland - Component 1: Southern Queensland and Component 2: Central Queensland

PROJECT DETAILS

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Summary

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Conclusions

The detail of R&D activities that have not previously been reported to GRDC is contained in Attachment 3. Broad conclusions drawn at this point in time are summarised below:

Faba beans:

This project has collaborated with Ian Rose from the National Faba bean Breeding Project in Narrabri. Breeding trials have been conducted at seven Queensland (QLD) sites and the data used to support the release of Cairo in 2003.

Field peas:

This project has collaborated with Steve Moore from the New South Wales (NSW) Field Pea Breeding Program based in Narrabri. QLD data from three sites were used to support the release of Kylie in 2001 and Yarrum⁽⁾ in 2003. The data will also support the release of Boreen in 2004 and 92-104P5*6 in 2005.

Mungbeans:

This project has collaborated intensely with DAQ00003, JAY3/4, CSP361, and DAQ56 (R Sequeira) in conducting and extending relevant information on best management practices for dryland mungbean growers, to the extent that many of the most crucial knowledge gaps have been filled. The logical path for continued expansion of the mungbean industry in Australia is in the irrigated farming systems, where reliability of supply and high quality product are distinct advantages. With tailored management packages, supplementary mungbean production from irrigated areas may provide the level of reliability necessary to provide the industry with a long-term sustainable future.

Chickpeas:

Similarly, many of the straightforward, issues important to chickpea production in dryland farming systems have been resolved. Accordingly, growers and agronomists are now very confident and are beginning to see how well adapted chickpeas are to the water limited environments of QLD (Attachment 2). Realising the full potential of chickpeas will require a continued R,D&E effort to maximise the benefits obtainable through moisture-seeking technology, movement into more marginal (sodic) environments, and into irrigated cropping systems. Following the severe disease impacts upon the 2003 chickpea crop, ongoing development of disease management practices and strategies is required.

The pulse success story in QLD can be largely attributed to the development of close relationships between the pulse team and growers, agronomists, and other projects. This has enabled continued relevance of the work conducted, and rapid meaningful dissemination of information from the R,D&E program.

Other research

While several of the key agronomic constraints to pulse production in QLD have been adequately addressed by DAQ500,

several important issues remain identified but unanswered. The 2003-06 phase of GRDC-funded pulse R,D&E in Qld (DAQ00061) aims to address many of these:

Optimal performance in irrigated cropping systems. DAQ500 has been highly successful at defining Best Management Practices (BMP) for dryland farming systems of QLD. However, pulses are increasingly being recognised as real options for irrigated growers. Irrigated systems in the north impose different constraints and opportunities, which have not been dealt with to date.

Moisture-seeking in chickpea: DAQ500 has been instrumental in fostering the rapid adoption of moisture-seeking/deep sowing practices in the northern region, largely through extension activities highlighting success. However, significant knowledge gaps exist, which need to be addressed before chickpeas can realise the full potential made possible by the practice. These include interactions with herbicides, effect of seed quality (size and age), and assessment of any genetic variation, which may exist.

Rhizobium delivery in the northern region: Agronomists and growers in the north continue to be confused about the erratic nature of nodulation success in mungbeans and chickpeas. Preliminary studies have produced worrying results: A pilot study in 2002 did not find the commercial rhizobium strain occupying nodules from any chickpeas crop sampled in CQ (five crops sampled). An experiment conducted in mungbeans found that the method of inoculum delivery most commonly employed by growers produced no greater levels of nodule occupancy by the commercial strain than did treatments without inoculation. This situation needs to be clarified and effective means of delivery developed.

Chickpeas in sodic soils: Performance of chickpeas on much of the northern region's soils is constrained by sodicity. This imposition usually occurs at moderate depth within the profile, such that crops will establish and grow, without achieving satisfactory yields in average or below average seasons. Innovative growers and agronomists are trying to develop solutions to this problem and these activities need to be supported/complemented with practical and focused science.

Sustainability concerns: Growers have recognised the potential for chickpea production and profit in QLD and the area under chickpeas is growing rapidly. However, concerns are being expressed about the long-term net impact on ground cover (and therefore runoff and soil movement) of a greater level of chickpea cropping, as chickpeas leave relatively small amounts of non-persistent crop residue.

Insect management: There is a serious need for research into heliothis thresholds for chickpeas. This work must take into account the different crop situations and the implications for heliothis management, i.e. dryland (long season and short season, such as CQ) and irrigated situations. Further, this also needs to be performed in conditions of high pressure during both vegetative and reproductive crop stages, evaluating the genuine role for biological insecticides.