INTERSTATE TRIALING SYSTEM AND THE AUSTRALIAN CROP ACCREDITATION SYSTEM

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SUMMARY

- The testing of early generation breeders lines in interstate trials has been extended over a range of sites and includes a range of maturities to better evaluate performance over southern Australia.
- Material is tested for yield, quality and blackleg resistance using set protocols to enable better lines to be promoted into individual state evaluation programmes.
- The Australian Crop Accreditation System has been developed to accredit the data that breeders use to promote cultivars after they have been released to ensure that farmers obtain information that is scientifically valid.

EARLY GENERATION INTERSTATE TESTING

Since 1983, advanced canola breeders lines being considered for release were evaluated in a formal interstate testing programme against control varieties. These lines were grown at about 14 sites throughout the canola growing areas of southern Australia. Grain quality was determined at the Agriculture New South Wales oilseeds laboratory. In addition, the blackleg resistance of the lines was evaluated in disease nurseries. Problems with this system were that: only a few lines (often less than 10) were tested each year; different maturities were tested in the one trial leading to harvesting problems; initial evaluation had often only been conducted in a relatively restricted area prior to interstate testing and some varieties were released after only one year of testing Australia wide.

In 1993 the system of testing was changed so that a larger number of earlier generation breeding lines could be evaluated. As a consequence of the need to develop a wider range of maturity for the many environments in Australia and the need for triazine tolerant canola, trials were split into 4 groups: early, mid and late flowering as well as triazine tolerant. For each group, breeders lines, mostly F_4 to F_6, are tested against a limited number of control varieties at 10 to 12 selected sites in the appropriate canola growing areas of southern Australia. Up to 33 breeding lines are tested within each group in replicated trials. Breeders lines are sourced from all public and private breeding programmes operating in Australia. These interstate trials, which are classified as S2 trials, contain lines that yielded well with good grain quality in breeders (S1) trials.

Yield results are analysed by spatial analyses. Cross site analyses are then used to determine the highest yielding lines. Grain quality is measured at the Agriculture New South Wales oilseeds laboratory. Oil, protein and glucosinolate content are measured on each replicate using a NIR System 4500 spectrometer. Fatty acid composition is tested by gas chromatography on one replicate from two sites.

Breeders lines are also tested in blackleg nurseries in New South Wales, Victoria, South Australia and Western Australia to determine the degree of resistance to blackleg. Replicated single rows are sown into infected canola stubble (or have canola trash spread over them) with plant numbers counted soon after plant emergence and again at maturity to determine the percentage plant survival.

Canola breeders lines that have high yield, superior blackleg resistance, and good grain quality are then promoted into wider scale testing within individual state canola testing programmes (S4 trials). This wider scale testing occurs for at least one year prior to the release of the cultivar.

Advantages of the new system of evaluation are: testing of a wider range of earlier generation lines at a number of different environments instead of initial evaluation by the breeder in few environments and coordinated testing of public and private breeding lines across Australia. Protocols used for testing are the same as those being developed for the Australian Crop Accreditation System.

With increased involvement from private breeding companies, the increased numbers of entries in the trials are stretching the system. The limited knowledge of the appropriate maturity group for early generation lines has meant some entries are initially misclassified for maturity.

Until general release is obtained for a transgenic type no breeders lines of this type are being in the interstate trials. Each breeding organisation is currently testing its own material under the regulatory guidelines for transgenic experiments. Promotion into trials conducted by state departments of Agriculture will occur after general release. Testing of different quality types is also currently the responsibility of individual organisations.

AUSTRALIAN CROP ACCREDITATION SYSTEM

The Australian Crop Accreditation System was established in late 1997 to allow information about new varieties to be accredited. Accreditation of information means that an independent body ensures that the information about a new cultivar has been produced using appropriate scientific protocols, and that farmers can rely on the information produced. To achieve this, five committees representing most crops have been established. An oilseeds committee comprising industry experts and farmers coordinates both canola and mustard. These committees have developed a set of protocols which have been widely published. Breeders are invited to submit the information they wish to accredit on their proposed new variety. If the committee accepts that the data were generated using appropriate protocols and that any conclusions drawn are valid, the committee will accredit the data and publish it annually. A crop database is being developed that can be accessed by farmers from the Internet. This database will allow farmers to compare cultivars within different agro-ecological zones of Australia and to make cultivar decisions based on both accredited and non-accredited data.

Submission of data for new varieties is voluntary, but it is envisaged that once the system becomes well known, farmers will be less likely to accept claims about cultivars that do not have accredited data.

FURTHER READING

Potter T., Mailer R. and Wratten N. (1989) The progression of rapeseed varieties to high yielding canola varieties as shown by the interstate variety trial. *7th Australian Rapeseed Agronomists and Breeders Workshop, Toowoomba,* pp. 20-24.

Potter T.D., Wratten N., Mailer R.J. and Salisbury P A. (1997) Interstate canola trials - summary of 1996 results. *11th Australian Research Assembly on Brassicas, Perth,* pp. 94-102.