

The contribution of private sector plant improvement programmes to the New Zealand wheat industry.

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Background

Since the advent of Plant Variety Rights (PVR) in 1973, several private sector organisations have invested in long term wheat improvement programmes. The impact and benefits of PVR on the arable industry research and development programmes has been previously discussed (Dunbier and Wynn-Williams, 1983; Bezar *et al.*, 1990). This involvement has complemented the work being carried out by the government sector and has resulted in a greater diversity of products being made available to the producer and consumer of wheat.

Private Sector Organisations

The private sector organizations involved are:

- Challenge Seeds Ltd.
- Hodder & Tolley Ltd.
- Pyne Gould Guinness Ltd.
- Agronomic Research (Southland) Ltd.

In monetary terms, the inputs in research, discounting capital costs, are estimated at \$300,000 p.a.

Cultivars are being produced by the following methods:

1. Crossing programmes conducted in New Zealand.
2. Individual selection from segregating lines under agreement with overseas breeders.
3. Evaluation of advanced breeding lines or finished varieties provided by overseas breeders or agents in replicated multi-site trials.

In the main, private sector varieties are being produced by methods 2 and 3, although some small crossing programmes are maintained. Each programme has identified useful sources of germplasm and/or varieties through cooperation with international breeding

programmes. The major contribution of CIMMYT material to government sector programmes (Burnett *et al.*, 1989) is now complemented by private sector germplasm originating from countries such as the United Kingdom, Sweden, France, Netherlands and USA.

Advantages of private sector involvement are:

- to provide an alternative genetic base of material. This should be viewed as an important component of the wheat industry strategy to provide resources for the different market segments, and to reduce the risk of environmental catastrophe such as disease outbreak.
- give impetus by useful competition.
- cost efficient variety production.

Challenges faced by the plant improvement programmes are:

- continuity of funding to long term programmes.
- rapid changes in quality requirements.
- changes in environmental stresses e.g., rust race changes.

Cooperation with Government Sector

There is a high level of cooperation between private and government sectors in wheat improvement programmes. Cultivars are tested in a joint trial series, with the results analysed and published annually in the form of Recommended Lists for autumn and spring sown cultivars. Funding of this List is carried out by the joint efforts of the trial operators, United Wheatgrowers NZ Ltd., and the New Zealand Flour Millers Association.

Private Sector Cultivars in Current Use

Information on the use of wheat cultivars is no longer easy to obtain. In the past, information was collated by the NZ Wheat Board. Other methods have included extrapolation from the production of certified seed, or

information collated from sample testing by the Grain Processing Laboratory. These methods do not now provide adequate data. Firstly, the use of certified wheat seed has declined to less than 30% seed planted (Kelly, unpublished) and secondly, the larger milling organisations send only a small proportion of delivery samples to the Grain Processing Laboratory (R. Wakefield; B. Hingston, pers. comm.).

Therefore, information has been collated from the following sources: Goodman Fielder, Champion Mills Ltd.; Defiance Flour Mills Ltd.; Allied Mills Ltd.; Canterbury Roller Flour Mills Ltd.; South Flour Ltd.; and the New Zealand Feed Manufacturers Association. Feed wheat is not usually contracted by cultivar, therefore accurate information on cultivar usage in this market segment was unable to be obtained. Feed areas which are contracted directly by cultivar, consist entirely of private sector cultivars (M. K. Dowie, pers. comm.).

The relative percentages of private sector cultivars used in each market segment are presented in Figures 1 to 6. The absolute tonnages have not been presented for reasons of commercial sensitivity.

Conclusion

Private sector plant improvement programmes have demonstrated their ability and potential to provide a valuable contribution to the wheat industry, and must be recognised as a cost effective method of cultivar development.

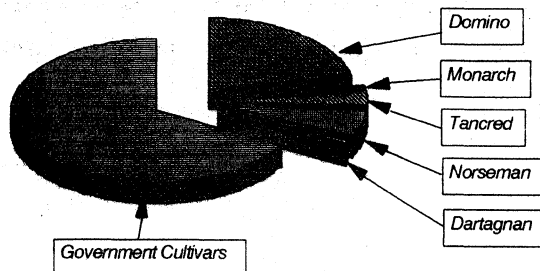


Figure 2. New Zealand bread wheat production 1991/92 - private cultivar use.

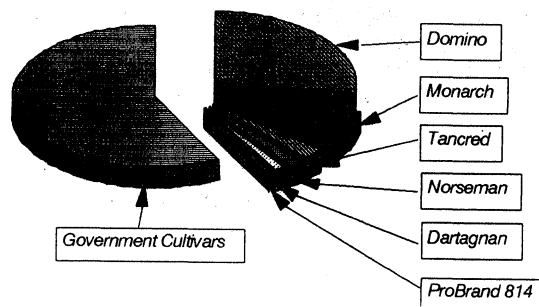


Figure 3. New Zealand bread wheat production 1992/93 - private cultivar use.

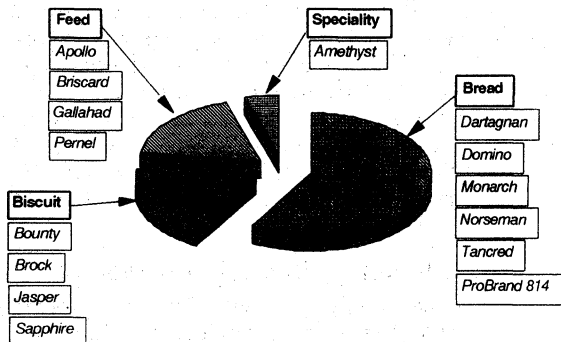


Figure 1. New Zealand wheat production - market segmentation.

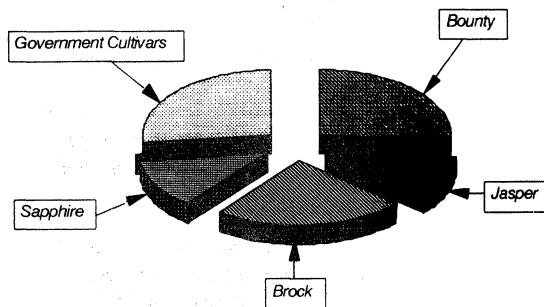


Figure 4. New Zealand biscuit wheat production 1991/92 - private cultivar use.

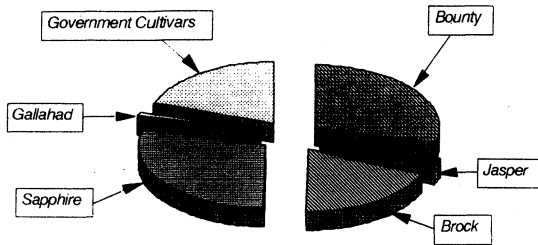


Figure 5. New Zealand biscuit wheat production 1992/93 - private cultivar use.

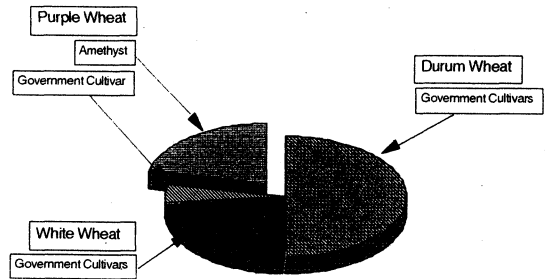


Figure 6. New Zealand speciality wheat production - private cultivar use.

References

- Bezar, H.J., Wynn-Williams, R.B. and Stewart, A.V. 1990. Plant variety rights in New Zealand: A review. *Proceedings Agronomy Society of New Zealand* 20, 17-23.
- Burnett, P.A., Eagles, H.A. Edmeades, G.O., McEwan, J.M., Brennan, J.P. and Griffin, W.B. 1989. CIMMYT

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- Dunbier, M.W. and Wynn-Williams, R.B. 1983. Plant Variety Rights in New Zealand - A decade of change reviewed. *Proceedings Australian Plant Breeding Conference*, 211-212.