

## Improved oat varieties for hay production

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Growing oats to produce oat hay has increased in the last five years in Australia. South Australia exported 40%, Western Australia 36%, Victoria 18%, and New South Wales 6% of the 388,918 t exported in 2000/01. Approximately 500,000 t was exported in 2002/03, with almost 400,000 t marketed in Japan. Expansion of the market is the result of replacing pellets and cubes with longer fibre as well as replacing sudan hay from the United States. The Japanese consider oat hay more palatable than sudan hay. To provide consistent, highly palatable oat hay, grading systems for fodder were implemented. Hay quality characters, such as water-soluble carbohydrate levels, digestibility, neutral detergent fibre (NDF), acid detergent fibre (ADF), and colour, are used to grade the hay and determine premiums to the growers. An increase in domestic intensive livestock production will also provide new opportunities for premium fodder domestically.

### Southern region oat breeding program

The oat breeding program is focused on breeding improved varieties for human consumption, animal feed, and hay production. The program has expanded this year to include providing new oat varieties for South Australia, Victoria, Western Australia, and New South Wales. The early generation population development is located at SARDI in Adelaide, with

*Pratylenchus neglectus*. Breeding lines are evaluated with specific pathotypes for resistance to stem and leaf rust and barley yellow dwarf virus in cooperation with the University of Sydney National Cereal Rust Control Program and NSW Agriculture. The oat breeding group also assess resistance to stem rust, leaf rust, septoria, barley yellow dwarf virus, and bacterial blight when the diseases occur in field trials. CCN and SN tolerance is assessed in trials specifically sown at locations infested with these pathogens.

Yield potential, agronomic characters, and disease resistance are assessed by the oat breeding group at SARDI and the Department of Agriculture Western Australia, the SARDI field crop evaluation program, and district agronomists in Victoria.

### Oat breeding program objectives and outcomes

- Provide growers and industry with improved oat varieties for hay end-use, so that the risk connected with producing first-grade oat hay is reduced,

selection occurring in the two major regions: eastern and western Australia. Evaluations of advanced breeding lines are conducted in all states using the field crop evaluation groups established in each state. There were 17 field trial sites in South Australia, including two cereal cyst nematode (CCN) and one stem nematode (SN) evaluation trials in 2002. Five trial sites were also sown in Victoria and two sites were sown in New South Wales. Evaluations will be expanded to include three sites in Western Australia this year.

### Breeding priorities

The objectives of the oat breeding program are to:

- Develop oat varieties for specific end-uses.
- Improve disease resistance, yield, and agronomic traits.
- Provide information about new and existing oat varieties.

Quality characters are important in the development of hay varieties. Such characters as digestibility, NDF, ADF, and water-soluble carbohydrates are among the nine quality characters assessed for the most advanced breeding lines in the hay evaluation trials.

Disease resistance plays a significant role in oat varietal development. Screening programs are in place with the SARDI Field Crops Pathology Group to assess breeding lines for resistance to CCN, SN, and

ensuring the highest economic return to growers: *released two new varieties for hay production, Wintaroo and Brusher.*

- Deliver high-yield-potential, value-added oat varieties for milling and animal feed end-use in diverse agro-ecological zones in southern Australia: *released one new milling variety, Possum.*

### New breeding tools

- Doubled haploids: Dr Phil Davies leads this program at SARDI. It developed as a cooperative project with Dr Taing Aung, Agriculture and Agri-Food Canada.
- Oat mapping: Dr Kevin Williams leads this program at SARDI as part of the CRC for Molecular Plant Breeding. The goal is to develop molecular markers for oat quality characters and disease resistance, such as CCN tolerance.