



Growing cereal rye

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September, 1995

AG0403

ISSN 1329-8062

Rye (Secale cereale) is a comparatively modern cereal, first cultivated in northern Europe. It is thought to have originated from wild types of rye, which are weeds, in wheat crops in Asia Minor.

Rye is a winter-spring cereal, with a similar growing period to the main winter-spring cereals, wheat, oats and barley. It is grown mainly in southern Australia, where its principal use is for stabilising drifting soils or for grazing. Grain production in South Australia represents about 70% of the Australian crop. In Victoria, about 85% of the area sown to rye is in the Mallee region. In New South Wales, however, its main use is to produce large plump grain for the milling industry, particularly for the crisp bread industry. It is mainly confined to the acid-soil belt and central-west slopes in NSW.

The average yield in Victoria varies from 0.4 to 1.0 tonne per hectare. Spring rainfall is a major influence on yield in the Mallee since the lighter soils have a low water holding capacity. A second reason for low yields is that unlike other cereals, rye must be cross pollinated. Often in hot weather much of the pollen dries out before it can fertilise neighbouring plants. The result is that the grain does not set properly. A third reason for low yields is that most varieties of rye require a fairly long period for grain formation. Rye grain is often small and shrivelled.

Use as an erosion control

Rye withstands adverse conditions better than other cereals. It can stand cold and limited waterlogging. More importantly, its drought resistance and ability to withstand sand blast enables it to produce a soil-binding cover on land where other cereals will not grow. Under conditions where wheat, oats or barley will grow only a few inches high, or may even be completely blown away, rye often will grow vigorously and reach a height of a metre or more.

Another reason for using cereal rye on erosion prone soils, is the fact that the grain and straw are the least preferred cereal by sheep. Sheep provided with more than one

choice of stubble within a paddock will leave rye straw alone.

After the crop is harvested, the tough, resilient straw is generally left as a protective cover to reduce the blowing of the soil, and to assist colonisation by other species. The straw of rye breaks up more slowly than the straw of other cereals, ensuring soil cover for a long period.

Varieties

Although cereal rye has been grown in Australia for more than 150 years, its agronomic development and breeding has been neglected in comparison to other winter-grown cereals. A number of ryecorn strains and selections have been introduced into Victoria at different times. It is usually referred to by names such as SA rye, South Australian strain rye, rye, cereal rye or ryecorn.

The majority of seed sown is almost entirely South Australian ryecorn selected over many years on Mallee districts and reasonably well adapted to the drier areas of Victoria. Small quantities of other cereal rye strains are sown in the high rainfall districts of NSW.

Breeding programs at the University of Sydney and the Waite Institute in Adelaide are continuing on a small scale. The Mallee Research Station, Walpeup in collaboration with the Waite Institute, the South Australian Research and Development Institute and Goodman Fielder Mills Ltd have a project to provide farmers in low rainfall environments with a high yielding, superior grain quality cereal rye variety.

Sowing

Rye for grain is sown at the same time as wheat, oats or barley, that is, in May or June, at 45-50 kg per hectare. Its root system branches extensively in the first 300 mm of soil. This is a major reason why rye is more drought resistant and does better on poorer soils than wheat. The well developed root system allows it to quickly produce a large bulk of early green feed which has a nutritive value comparable with other cereals.

If seasonal conditions are unfavourable for pasture growth in the Mallee, cereal rye is often sown dry during March for green feed. The sowing rate should be increased to 80-100 kg/ha to maximise fodder production. Graze when plants are 150 mm high and tillering. The later stages of growth are stemmy and unpalatable to stock. Cereal rye is not a suitable hay crop.

For the purposes of green manure cereal rye can be sown February or March or as late as August in high rainfall areas.

Fertiliser

Phosphorus fertiliser and, where necessary, nitrogen fertiliser are recommended in the same amounts as recommended for wheat.

The current recommendations for the Mallee are:

- Phosphorus at 15 kg/ha applied at sowing.
- On lighter soils or sand hills, 20 kg/ha of nitrogen broadcast at seeding or within 6 weeks of sowing.
- Alternatively 10-15 kg/ha of phosphorus and 10-20 kg/ha of nitrogen in the form of a compound fertiliser.

Harvesting

Although rye comes into ear earlier than wheat, the grain takes much longer to mature. The crop should be harvested as soon as the grain is thoroughly dry and hard. Seed losses due to shattering can occur soon after it ripens. Rye is harvested with a conventional header. The grain is lighter and longer than wheat, so the machine will require minor adjustments from normal wheat settings.

Pests and diseases

Rye in the paddock is generally free from insect pests. Where problems arise, growers should contact their local centre of DPI for advice.

Cereal rye grain does not store well unless frequently treated for insect contamination. To minimise insect attack, the grain should be stored at less than 10% moisture, preferably in sealed silos. Treat the grain as it enters the silo and then check regularly (2-3 months) for reinfestation by grain insects.

The most important disease of rye is ergot (*Claviceps purpurea*), but this is not generally a problem in the Victorian Mallee. Nevertheless, it is important to realise that feeding stock with ergot infested grain can result in serious losses. Stem and leaf rusts can usually be seen on

cereal rye in most years but they are only occasionally a serious problem.

The grain

Rye grain is smaller and darker than wheat, is harder to mill and produces a lower percentage of flour. The hectolitre weight is normally about 70 kg, although commercial trading is generally on the basis of 74 kg/HL. The grain protein tends to be slightly lower than that of wheat. The dough lacks the elastic properties of wheaten dough. Bread made from rye flour has a close texture and a slight "tang".

Demand

Demand for cereal rye has been static for a number of years with domestic consumption around 25 000 tonne per annum. Local use for rye is mainly in the form of kibbled rye or cracked grain for use in mixed grain breads or for breads requiring more fibre. Demand has also increased, but to a lesser extent, for sour-dough rye bread, rye flour and rye meal.

Production in Australia is generally erratic, with supply and demand very elastic and price sensitive. Seasonal conditions and the soil type and topography where rye is usually grown, greatly influence seasonal production. Supply shortfalls are usually met by the importation of grain from Canada.

Marketing

The Australian Wheat Board purchases cereal rye on behalf of a number of clients. It provides space for delivery to selected silos or delivery to designated outlets by arrangement. Other major purchasers of rye include Goodman Fielder Mills Ltd, Weston Milling, Bunge (Australia) Pty Ltd and Defiance Milling Company Pty Ltd. A number of small millers purchase cereal rye by contract or negotiated price post harvest.

The Cereal Rye Growers Association (incorporated in South Australia) meets regularly at Pinnaroo (SA) to discuss production, supply, demand, marketing, promotion and prices. The organisation has contact with a broad range of personnel involved in various aspects of the cereal rye industry. The group can be contacted at: PO Box 56, Pinnaroo SA 5304, phone: (085) 778280 fax: (085) 778521.

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