

Mackellar

Dual Purpose Wheat

VARIETY SUMMARY

- Dual purpose winter wheat for grazing as well as grain production
- The only BYDV resistant winter wheat cultivar in Australia
- Red feed quality grain
- Awnless to allow cutting for hay or late season grazing
- Excellent forage production

BREEDING

Mackellar (LH64C) was bred by the CSIRO winter wheat breeding team. Mackellar has been commercialised by AWB Seeds under an exclusive licensing agreement.

PLANT CHARACTERISTICS

Mackellar is a red grained, feed wheat. It is awnless which makes it suitable for late grazing and cutting for hay. It has a medium harvest height, is moderately resistant to lodging and has been selected to recover after grazing to produce high yields. Similar to the other red grained winter wheats Tennant and Rudd, Mackellar is tolerant to pre-harvest sprouting. CSIRO test results have shown Mackellar to have an average coleoptile length.

DISEASE AND PEST RESISTANCE

Table 1: Plant characteristics and disease resistance of Mackellar in comparison to other varieties.

| Variety | Head Type | | Sprouting Tolerance | Yellow Leaf Spot | Septoria | Rust Resistance | | | Lodging Resistance | BYDV Resist |
|-----------|-----------|-----|---------------------|------------------|----------|-----------------|------|--------|--------------------|-------------|
| | Colour | Awn | | | | Stem | Leaf | Stripe | | |
| Mackellar | Red | No | T | MS | MR | MR | S | R | MR | R |
| Rudd | Red | No | T | MS/MR | R | R-MR | R-MR | R | R | T |
| Brennan | White | No | I | MS | MR | MR-MS | R-MR | R | MR | n/a |
| Declic | Red | Yes | T | n/a | n/a | S | S | R | R | S |

Plant and Disease Terms: T - Tolerant, MT - Moderately Tolerant, MI, Moderately Intolerant, I - Intolerant, R - Resistant, MR - Moderately Resistant, MS - Moderately Susceptible, S - Susceptible, VS - Very Susceptible, H - High, M - Medium, L - Low, VL - Very Late, L - Late, M - Medium, E - Early, VE - Very Early, N/a - Not available

SOIL TYPE

Mackellar generally performs well on a range of soil types, however deep, well-drained soils are considered ideal. Winter wheats are able to tolerate waterlogging for short periods, although with reduced production rates. Mackellar is moderately intolerant of acid soils.

MATURITY

Mackellar is a long season variety which has a vernalisation (exposure to cold) requirement before it will flower and produce grain.

When the vernalisation requirement has been met, flowering in Mackellar will occur at a similar time as Dennis or Declic. Mackellar can be sown from late February to June. If sown early, Mackellar must be grazed otherwise grain yield could be reduced. Mackellar has been selected to recover after grazing and produce high grain yields. Mackellar can also be grown as a grain only crop if sown from late March to late June.

AREA OF ADAPTATION

Mackellar is best adapted to the shorter season regions of the high rainfall zone. This area includes the slopes of NSW, irrigated areas, the drier parts of the long growing season area in VIC and SA, and the cooler areas of southwest WA.

GRAIN QUALITY

Mackellar produces grain that is red in colour and has the maximum classification of SFW (Special Feed Wheat) under AWB Limited classification system.

 **YIELD****Table 2.** Grain yield across the longer season sites of NSW and 2001 season results in Victoria.

| Variety | NSW dry matter and grain recovery as a % of Whistler 1996-2002 | | | 2001 replicated variety trials as a % of Kellalac | | | | | | |
|------------------|--|--------------------|----------------|---|------------|------------|-----------|------------|-------------|------------|
| | Dry Matter 1st cut | Dry Matter 2nd cut | Grain Recovery | Gnarwarre | Hamilton | Streatham | Wonwondah | Lake Bolac | Bool Lagoon | Rutherglen |
| Mackellar | 88 | 97 | 112 | 189 | 146 | 126 | 98 | 125 | 100 | 97 |
| Rudd | 86 | 93 | 111 | 123 | 106 | 107 | 89 | 104 | 100 | 92 |
| Brennan | 94 | 96 | 102 | 140 | 91 | 103 | 87 | 107 | 103 | 85 |
| Currawong | 101 | 102 | 109 | 103 | 117 | 103 | 105 | 98 | 96 | 102 |
| Declic | - | - | - | 107 | 105 | 112 | 98 | 112 | 103 | 97 |
| Whistler | 100 | 100 | 100 | 107 | 110 | 100 | 109 | 99 | 96 | 110 |

Data Source: NSW Agriculture

Data Source: CSIRO, DNRE

 **AGRONOMIC GUIDELINES****Sowing**

- Winter wheats require a dormancy period. This is important to remember when planning to sow farmer retained seed. Dormancy can have significant impact on the viability of the seed. A germination and vigour test should take place prior to sowing.
- Sowing rates vary from region to region, please refer to your local DPI sowing guide or respective agronomist. To accurately determine the correct sowing rate (plant density), fill in the table below to calculate a kg/ha rate.

| | | | | | | |
|-------------------------------|---|-------------------------|---|-----|---|---------------------------------------|
| 1000 Seed Weight (grams) | x | Target Plant Population | ÷ | 100 | ÷ | Establishment % x Germination % |
| | | | | | | |
| = Your Seeding Rate.....kg/ha | | | | | | |

Grazing

- A major advantage of dual purpose winter wheats is their ability to be grazed by stock. Long season winter wheats are the only wheats suitable for winter grazing as they do not begin to develop ears before mid-winter.
- Early grazing of autumn sown wheat will remove leaf canopy and reduce growth to minimum rates. To encourage rapid crop growth, and to maximise forage production, it is recommended that the crop be left ungrazed until early winter.

- Close monitoring of Mackellar should take place during spring to ensure that any stock is removed immediately when above ground head formation is detected. Jointing is evidence that ears are well above ground level and that stock should have previously been removed.
- Growers should monitor the progress of the crop to best determine when stock should be removed. By vertically slicing main shoots, growers will be able to check that the growing point remains below the soil surface whilst grazing continues.

Nutrition

- Successful winter wheat crops require proper nutrition. A 5 tonne per hectare winter wheat crop requires a minimum of 20kg/ha actual phosphorous and 100kg/ha of actual nitrogen, which must be drawn either from the soil or obtained through fertiliser applications.
- Nitrogen fertiliser application to winter wheat is best split between time of sowing and spring or after stock removal. Application of Phosphorous fertiliser to winter wheat is best banded with the seed or pre applied.

 **PLANT BREEDER RIGHTS AND ROYALTIES**

Mackellar is protected by Plant Breeder Rights, any unauthorised commercial propagation or any sale, conditioning, export, import or stocking of propagating material of this variety is an infringement under the Plant Breeder's Rights Act, 1994.

Growers are allowed to retain seed from production of this variety for their own use as seed only.

A Seed Point Royalty is included in the purchase price of seed.

ACKNOWLEDGEMENTS

Mackellar was bred by CSIRO with support from AWB Limited and growers through the GRDC.



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