

Milk production potential from WA Seed Productivity trials

This year Western Dairy established trials at two sites with differing soil types; 9 ryegrass lines at the dairy support block at “Carenda Holsteins”, owned by the Kitchen family at Boyanup (site of the 2017 trials); and 10 lines on the Brett family milking platform at Dardanup. The Boyanup soils were characterized as sandy soils over clay and a soil test (Table 1) indicated that the soil had a low pH and was lacking in phosphorus and potassium. In response to the soil test 4 Tonnes of lime/ha was applied in March 2018. Soil tests from the Dardanup site indicated a higher soil pH and better fertility than the Boyanup site. At both sites fertiliser was applied at planting and after each harvest at rates so that plant nutrients would be non-limiting to production.

Table 1. Key soil fertility indicators at the WASP trial site from 2018 soil tests (CSBP soils laboratory)

| 0 to 10 cm soil depth | Soil type | pH (CaCl ₂) | Organic carbon (%) | Phosphorus mg/Kg (Colwell) | Potassium (mg/Kg (Colwell)) | PBI |
|-----------------------|-----------------------|-------------------------|--------------------|----------------------------|-----------------------------|-----|
| Desirable | | > 5.0 | 3.0 | 29 | 126 | |
| Boyanup | Duplex sand over clay | 4.2 | 2.8 | 27 | 52 | 26 |
| Dardanup | Clay loam | 4.9 | 3.5 | 44 | 75 | 172 |

The MPP \$/ha is calculated as a value relative to “Control 2018” (Tables 2 and 3). “Control 2018” is the seed from a ryegrass brand that has been safely stored and will be included each year in the trials. Other ryegrass lines will be compared with “Control 2018” including “Control fresh” which is the same brand as “Control 2018” but purchased in the year of the current trial. “Control 2018” will always be indexed as \$0/ha and all other lines will have a positive or negative index compared to it. The MPP calculation takes into account; energy yield (dry matter x metabolizable energy); energy requirements for milk production; milk price; feed utilization; and sowing costs. Contact peter.hutton@westerndairy.com.au for details.

Seed lines are ranked by highest to lowest MPP and indexes are significantly different when they do not share a common coloured bar. For example, in Table 3 “Control fresh” is significantly higher than “Hogan” but “Abundant” is not significantly higher than “Hogan”.

Table 2. Boyanup indexes for relative milk production potential

| Seed | MPP \$/ha | Seed company | Brand/variety | Type and Ploidy | Heading time |
|---------------|-----------|----------------|---------------|--------------------|--------------|
| Control 2018 | 0 | | Brand | Annual tetraploid | Early |
| Abundant | -14 | Irwin & Hunter | Variety | Annual tetraploid | Mid |
| Control fresh | -56 | | Brand | Annual tetraploid | Early |
| Diamond T | -57 | PGG Wrightson | Brand | Annual tetraploid | Early |
| Vortex | -176 | Heritage | Variety | Annual tetraploid | Mid |
| Amass | -210 | Landmark | Variety | Italian tetraploid | Late |
| Astound | -256 | Landmark | Variety | Annual tetraploid | Early/Mid |
| Attain | -301 | Landmark | Variety | Annual tetraploid | Mid |
| Ascend | -422 | PGG Wrightson | Variety | Annual tetraploid | Late |

Table 3. Dardanup indexes for relative milk production potential

| Seed | MPP \$/ha | Seed company | Brand/variety | Type and Ploidy | Heading time |
|---------------|-----------|----------------|---------------|--------------------|--------------|
| Control fresh | 232 | | Brand | Annual tetraploid | Early |
| Control 2018 | 0 | | Brand | Annual tetraploid | Early |
| Abundant | -6 | Irwin & Hunter | Variety | Annual tetraploid | Mid |
| Amass | -10 | Landmark | Variety | Italian tetraploid | Late |
| Hogan | -66 | Heritage | Variety | Annual tetraploid | Late |
| Attain | -176 | Landmark | Variety | Annual tetraploid | Mid |
| Astound | -263 | Landmark | Variety | Annual tetraploid | Early/Mid |
| Concord II | -264 | PGG Wrightson | Variety | Italian diploid | Late |
| Vortex | -290 | Heritage | Variety | Annual tetraploid | Mid |
| Ascend | -668 | PGG Wrightson | Variety | Annual tetraploid | Late |

The MPP tables show consistency of seed lines across the sites. “Control” and “Abundant” had the highest indexes at both sites and “Ascend” was lowest at both sites. This reflects on the robustness of the trials for producing accurate and relevant information. The MPP ranking for “Amass” was higher at the Dardanup site than Boyanup and can be explained by the differences in soil type between sites. The slightly longer season on the clay-based soils at Dardanup provided an additional harvest for “Amass”, which is a late heading Italian ryegrass.