

5.2 THE IMPACT ON LIVESTOCK, GRAIN YIELD AND STUBBLE MASS FROM GRAZING CEREALS IN WINTER (DERRINALLUM, CERES, LEARMONTH VIC)

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Location: Derrinallum, Ceres and Learmonth

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Rainfall (2005): not recorded

Summary:

Three farmer trials (one replicated, 2 unreplicated) were conducted to assess the impact on grain yield and stubble mass by grazing in winter. Grazing of the cereals up to growth stage 31 had no significant impact on grain yield but it did reduce the amount of stubble remaining post harvest. Grazing after growth stage 31 did reduce yield and further reduce stubble mass.

Background:

The increase in cereal production in south west Victoria has resulted in higher winter stocking rates on the remaining grazing land. This placed increased demand on pastures that are already restricted in their growth by cold wet conditions. If cereals could be grazed during this period without compromising grain yield, it would provide an opportunity to increase stocking rates and/or decrease supplementary feeding. Grazing may also have a benefit in reducing the amount of stubble remaining post harvest.

Research has shown grain and forage yields are greatly influenced by the time and intensity of grazing. The later the time of grazing and the more severe the grazing intensity, the greater the likelihood of suffering yield reductions. The selection of unsuitable varieties can also result in unacceptable yield reductions from grazing.

To begin to understand the interactions between grazing, livestock benefits and the effect on grain yield and stubble aftermath, three investigative trials were conducted to determine critical issues for further investigation.

Objectives:

To examine the livestock benefits and impacts on cereal yield and stubble aftermath by grazing.

Table 5-3: Experimental Design

| Location | Area | Treatments | Replicates |
|-------------|--------|--|------------|
| Ceres | 4 ha | 2 varieties x 2 growth stages at grazing x 3 grazing intensities | 3 |
| Derrinallum | 2.4 ha | 4 varieties x 1 grazing time | 1 |
| Learmonth | 4 ha | 3 varieties x 1 grazing time | 1 |

Exclusion cages were used to prevent stock grazing the trial at certain times. The remainder of the cereal was grazed during this period. Quadrant cuts were taken inside and outside the exclusion cages to determine drymatter and feed quality. Cereal yield was also determined by quadrant cuts and drymatter analysis.

| Location | Sowing Date | Cereal | Variety | Date Grazing Start | Grazing Days | Grazing Stage | Grazing Intensity |
|-------------|----------------|-----------|-------------|--------------------|---|---|-----------------------|
| Ceres | 11/07/05 | Barley | Cape | 22/08/05 | 2 ⁹ | GS22 | Nil, to 9 cm, to 5 cm |
| | | | | 12/09/05 | 11 ¹⁰ | GS31 | Nil, to 9 cm, to 5 cm |
| | | | | 23/09/05 | 14 ¹¹ | 2 nd grazing of GS22 at GS33 | From 30 cm to 28 cm |
| | | Yerong | 22/08/05 | 2 | GS22 | Nil, to 9 cm, to 5 cm | |
| | | | 12/09/05 | 11 | GS31 | Nil, to 9 cm, to 5 cm | |
| | | | 23/09/05 | 14 | 2 nd grazing of GS22 at GS33 | From 25 cm down to 19 cm | |
| Derrinallum | 04/05/05 (dry) | Red wheat | Declic | 20/07/05 | 15 ¹² | GS24 | To 2 cm |
| | | | Amarok | | | GS23 | To 2 cm |
| | | Triticale | Crackerjack | | | GS23 | To 2 cm |
| | | | Monsteress | | | GS23 | To 4 cm |
| Learmonth | 28/06/05 | Triticale | Jackie | 16/09/05 | 33 ¹³ | GS27 | Not recorded |
| | | | AT574 | | | GS27 | |
| | | Oats | Eurabbie | | | GS26 | |

⁹ Grazed with first cross lambs

¹⁰ Grazed with first cross bred ewes with lamb at foot

¹¹ Grazed with cross bred ewes with lamb at foot

¹² Grazed with late pregnancy second cross ewes

¹³ Grazed with second cross ewes with lamb at foot

Results and Discussion

Table 5-4: Drymatter Consumed By Grazing

| Trial | Cereal | Variety | Grazing Stage / Intensity | Drymatter Removed By Grazing (kg/ha) |
|-------------|-----------|-------------|---|--------------------------------------|
| Ceres | Barley | Cape | GS22 to 9 cm | 50 |
| | | | GS22 to 5 cm | 60 |
| | | | GS31 to 9 cm | 540 |
| | | | GS31 to 5 cm | 1330 |
| | | | 2 nd grazing of GS22 at GS33 | 390 |
| | | Yerong | GS22 to 9 cm | 90 |
| | | | GS22 to 5 cm | 10 |
| | | | GS31 to 9 cm | 350 |
| | | | GS31 to 5 cm | 830 |
| | | | 2 nd grazing of GS22 at GS33 | 510 |
| Derrinallum | Red wheat | Declic | GS24 | 290 |
| | | Amarok | GS23 | 360 |
| | Triticale | Crackerjack | GS23 | 720 |
| | | Monsteress | GS23 | 410 |
| Learmonth | Triticale | Jackie | GS27 | 1970 |
| | | AT574 | GS27 | 2070 |
| | Oats | Eurabbie | GS26 | 2650 |

Table 5-5: Cereal Yield Comparisons, Grazed V Ungrazed

| Trial | Cereal | Variety | Grazing stage / intensity | Grain yield (t/ha) | Difference in yield due to grazing (t/ha) |
|-------------|-----------|-------------|---|--------------------|---|
| Ceres | Barley | Cape | No grazing for GS22 | 3.8 | |
| | | | GS22 to 9 cm | 4.0 | + 0.2 |
| | | | GS22 to 5 cm | 4.3 | + 0.3 |
| | | | No grazing for GS31 | 2.2 | |
| | | | GS31 to 9 cm | 3.0 | + 0.8 |
| | | | GS31 to 5 cm | 2.9 | + 0.7 |
| | | | 2 nd grazing of GS22 at GS33 | 3.6 | + 1.4 |
| | | Yerong | No grazing for GS22 | 4.4 | |
| | | | GS22 to 9 cm | 3.7 | - 0.7 |
| | | | GS22 to 5 cm | 4.8 | + 0.4 |
| | | | No grazing for GS31 | 4.7 | |
| | | | GS31 to 9 cm | 4.1 | - 0.6 |
| | | | GS31 to 5 cm | 3.2 | - 1.5 |
| | | | 2 nd grazing of GS22 at GS33 | 2.8 | - 1.9 |
| Derrinallum | Red wheat | Declic | No grazing | 2.8 | |
| | | | GS24 | 2.8 | 0.0 |
| | | Amarok | No grazing | 3.7 | |
| | | | GS23 | 3.6 | - 0.1 |
| | Triticale | Crackerjack | No grazing | 3.5 | |
| | | | GS23 | 3.9 | + 0.4 |
| | | Monsteress | No grazing | 3.2 | |
| | | | GS23 | 3.3 | + 0.1 |
| Learmonth | Triticale | Jackie | No grazing | 8.7 | |
| | | | GS27 | 1.6 | - 7.1 |
| | | AT574 | No grazing | 10.6 | |
| | | | GS27 | 3.9 | - 6.7 |
| | Oats | Eurabbie | No grazing | 9.1 | |
| | | | GS26 | 3.3 | - 5.8 |

Table 5-6: Residual Stubble Post Harvest, grazed V ungrazed

| Trial | Cereal | Variety | Grazing stage / intensity | Stubble yield (t/ha) | Difference in stubble yield due to grazing (t/ha) |
|-------------|-----------|-------------|---|----------------------|---|
| Ceres | Barley | Cape | No grazing for GS22 | 5.3 | |
| | | | GS22 to 9 cm | 6.4 | + 1.1 |
| | | | GS22 to 5 cm | 7.7 | + 2.4 |
| | | | No grazing for GS31 | 7.0 | |
| | | | GS31 to 9 cm | 5.7 | - 1.3 |
| | | | GS31 to 5 cm | 3.3 | - 3.7 |
| | | | 2 nd grazing of GS22 at GS33 | 4.6 | - 2.4 |
| | | Yerong | No grazing for GS22 | 6.7 | |
| | | | GS22 to 9 cm | 5.8 | - 0.9 |
| | | | GS22 to 5 cm | 6.6 | - 0.1 |
| | | | No grazing for GS31 | 5.9 | |
| | | | GS31 to 9 cm | 4.8 | - 1.1 |
| | | | GS31 to 5 cm | 4.7 | - 1.2 |
| | | | 2 nd grazing of GS22 at GS33 | 3.1 | - 2.8 |
| Derrinallum | Red wheat | Declic | No grazing | 8.5 | |
| | | | GS24 | 7.4 | - 1.1 |
| | | Amarok | No grazing | 8.5 | |
| | | | GS23 | 7.1 | - 1.4 |
| | Triticale | Crackerjack | No grazing | 8.4 | |
| | | | GS23 | 8.4 | 0.0 |
| | | Monsteress | No grazing | 8.8 | |
| | | | GS23 | 8.2 | - 0.6 |
| Learmonth | Triticale | Jackie | No grazing | 13.8 | |
| | | | GS27 | 5.2 | - 8.6 |
| | | AT574 | No grazing | 17.4 | |
| | | | GS27 | 7.8 | - 9.6 |
| | Oats | Eurabbie | No grazing | 10.9 | |
| | | | GS26 | 5.9 | - 5.0 |

Table 5-7: Quality Of Cereal At Time Of Grazing

| Variety | Quality | | |
|-----------------------|---------------------------------|-------------|-------------------------------|
| | Metabolisable energy (MJ/kg DM) | Protein (%) | Drymatter digestibility (DDM) |
| Cape barley | 12.6 – 13.6 ¹⁴ | 28.2 – 39.8 | 84.4 – 91.8 |
| Yerong barley | 12.9 – 13.5 | 28.4 – 39.6 | 84.4 – 91.1 |
| Declic red wheat | 12.3 | 35.9 | 83.2 |
| Amarok red wheat | 12.9 | 35.0 | 87.2 |
| Crackerjack triticale | 12.5 | 36.1 | 84.7 |
| Monsteress triticale | 12.5 | 36.4 | 84.4 |
| Jackie triticale | 11.3 | 27.9 | - |
| AT574 triticale | 12.5 | 26.0 | - |
| Eurabbie oats | 11.1 | 22.5 | - |

¹⁴ Range depends on time of grazing