FORAGE FOCUS

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PGG Wrightson Seeds

Repairing Pugged Pastures

NZ farming relies on grass to feed our animals throughout the year, and pasture damage due to pugging can occur when being grazed during wet & stormy conditions. Pugging occurs when the soil is so soft due to waterlogging that the surface can no longer support the weight of grazing animals, and hooves push into the soil.

In ideal circumstances cattle would be stood off during periods of pugging risk to reduce damage. However during extended periods of heavy weather some pasture damage is inevitable.

Rolling or harrowing has historically been practiced on pugged pastures to improve surface water runoff, but has been shown to have insignificant effect on recovering dry matter (DM) yield. Reseeding has been shown to have a long-term beneficial effect on the production and composition of pugged pastures.

Paddock Effects of Pugging

When paddocks are pugged in wet conditions, pasture growth is affected by both soil factors and plant damage. The soil factors that impact upon grass growth include reduced drainage (runoff & infiltration) causing soil temperatures to remain colder for longer, and soil compaction causing anaerobic conditions to develop. Plant factors reducing pasture performance include extensive tearing and burying of plants, including ryegrass tiller damage.

These combined effects can reduce grass tiller density to less than one third of normal levels, in turn reducing ground cover to less than 45% (compared to 90% cover in undamaged pasture). Overall there can be more than a 40% decrease in growth rates, depending on tiller density & canopy cover.

Effects of Pugging on Productivity

Within weeks of pugging occurring, the productivity differences between undamaged and damaged pastures become clear. Pasture utilisation is reduced by 20-40%, and total pasture yield can be reduced by between 20-80% for up to 8 months, depending on soil type.

Several years after damage, the pastures may appear to have returned to normal but the pasture composition has changed. However when desirable plants are removed through the initial damage, gaps are left in the sward. These are quickly filled by undesirable species that were previously suppressed by the dense, vigorous ryegrass sward. Weeds including *poa spp*., yorkshire fog, browntop and couch, all of which have poorer total production, less desirable seasonal production patterns, and are of lower feed value than ryegrass. Even two years after damage, total DM production can be as much as 15-20% lower than previous levels.

Actions to Repair Pugged Pastures

Performance of the productive pasture species needs to be restored as soon as possible to maximise growth at critical times of the year. Doing nothing is not an option that can be economically considered. Regrowth from remaining roots, shoots & grass tillers will not fill the gaps left in the sward. Doing nothing will allow unproductive species to invade the pasture and even in two years DM production will not be equal to that before damage occurred.

Subsoiling has been suggested as an option to reduce compaction and increase root penetration and water & air movement in the soil. It perhaps speeds up the recover process, but has very little effect on total DM production of the sward, as it does not help the damaged plants recover, so undesirable species will still invade.

Traditionally roller or harrows were used to level pugged paddocks. Research at Taranaki Agricultural Research Station (TARS) has shown that levelling has a positive effect on the soil surface and improves surface water runoff, but has no effect on DM production.

The same study demonstrated that reseeding with ryegrass has an immediate impact on the annual DM production with a 16% increase that spring, when compared to rolling, harrowing, or no treatment. It was found that broadcasting the seed in conjunction with harrows or cambridge roller was more successful than direct drilling, though drilling was still better than just harrowing. The long-term benefits gained from reseeding were improved pasture composition (over untreated or levelled) and further improvements in DM yield.

Reseeding success relies on careful management and rapid establishment of the new plants, and there are risks associated with planting a low vigour cultivar into the sward. Rapid establishing cultivars should be used to ensure successful undersowing. Hybrid grasses like Maverick Gold have rapid establishment and can persist in the pasture for 2-4 years. If the area is going to be fully renovated within the next 18 months, use a tetraploid italian ryegrass like FEAST II™. Tetraploid grasses have a larger seed size hence a very

vigorous establishment. Note: tetraploids need to be sown at 40% higher seed rate/ha to account for larger seed size.

There is an opportunity to regrass the paddock in conjunction with a summer crop to break pest, weed and endophyte cycles. Once the area dries out it can be sprayed with ROUNDUP® for control of pasture weeds, cultivated after any drainage has been carried out and planted with BARKANT™ Turnips. Even a poor summer crop will grow more DM than a badly damaged pasture & it provides the opportunity to sow the pasture with an improved, novel endophyte ryegrass with superior animal performance.

Noting that ROUNDUP® is more effective on perennial pasture weeds when applied as an Autumn spray, pastures with perennial weeds such as couch, paspalum, kikuyu, browntop etc. should have at least one, preferably two Autumn Roundup sprays built into the program, as per the WRIGHTSON SEEDS PROGRAMMED APPROACH™ (Forage Focus No. 1).

Best Practice Pugging Repairs

- Calculate how many hectares of BARKANT™ Turnips you will need this summer. Select the worst affected areas for your turnip paddocks.
- Pugged areas set aside for BARKANT™ Turnips can be grazed until late September. Allow 10 days for paddock to freshen up and spray out with ROUNDUP® RENEW XTRA.
- Cultivate paddocks and prepare a fine, firm seedbed.
- Follow “Best BARKANT™ Turnips” (Forage Focus No. 2) to achieve maximum potential for that paddock.
- After the BARKANT™, resow your quality pasture crop.
- As soon as the remaining pugged paddocks are dry enough to support light machinery, eat down any regrowth to 4-5cm height.
- Any areas that will be put into summer crop in 12 months will be sown with FEAST II™. The remainder will be sown with Maverick Gold.
- SUPERSTRIKE® seed protection can be used to improve seedling establishment and protect against insects and fungal pathogens. When using SUPERSTRIKE®, sowing rates can be lowered by 20%. Note: withholding period for grazing SUPERSTRIKE® coated seed is 42 days. SUPERSTRIKE® should be used in areas that will be grazed later in the rotation.
- Broadcast or roller drill 15kg/ha Maverick Gold or 18kg/ha FEAST II™, and cover seed with harrows or Cambridge roller. NB: covering the seed is essential for successful establishment.
- First grazing using treated seed should be immediately after the withholding period and should be a short, sharp grazing to reduce competition from the remnant pasture.
- Apply N-RICH™ urea after the first grazing to promote tillering of new grass.
- Paddock can then be fitted back into the normal rotational grazing program.

In Summary

Pugging damage has a major effect on the productivity of our pastures.

Reseeding severely pugged areas with vigorous cultivars of ryegrass has a long term effect on DM production and pasture composition. Less productive grasses and other weeds will rapidly invade areas not undersown.

Pugging damage is best repaired by temporary regrassing in conjunction with a summer turnip crop, followed by a highly productive ryegrass & clover pasture crop.

References

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