

96/S02



Producer Research Support

Herbicides tested in weed and control trial

Upper South East Tagasaste Growers



This trial was undertaken to determine the most efficient and effective forms of weed control for establishing tagasaste using 'row' direct seeding on sites dominated by Veldt Grass and Evening Primrose.

The project

Tagasaste, otherwise known as Lucerne Tree or *Chamaecytisus palmensis*, is becoming an increasingly popular fodder shrub in many agricultural areas in South Australia, especially in the upper south-east.

Farmer experience suggests that in below average rainfall and with poor timeliness tagasaste can be established very successfully in lupin crops. This is a reflection of good weed control and soil management. However, much of the tagasaste is being established using the 'row' method of direct seeding as described by Dalton (Direct Seeding of Trees and Shrubs, a manual for Australian conditions, SA Primary Industries 1993).

Weed control has often been unreliable, causing failure in tagasaste establishment. Inconsistent results have been achieved in pastures dominated by Veldt Grass (*Ehrharta calycina*) and/or Evening Primrose (*Oenothera sp.*), so this Producer Research Support project was timely.

Objective

1. Determine best establishment methods;
2. Preferred management with herbicide; and
3. Determine local carrying capacity on established stands.

What was done

The main criterion was cost. Direct seeding ranges in cost from \$50 to \$80/ha, while speedlings and bare rooted seedlings vary from \$80 to \$200/ha. Speedlings and bare rooted seedlings can be very useful on erosion prone or particularly difficult weedy sites, where direct seeding will struggle. High quality speedlings and bare rooted seedlings should be purchased.

It was the herbicide trial results that provided much extra information.

The knockdown treatments were based on the most effective herbicides for controlling the dominant weeds in preparation for direct seeding.

Different rates of simazine were trialed because it is a low cost popular residual herbicide that is often used for weed control with direct seeding tagasaste.

However, it is not known what simazine's safety limits are for balancing good weed control of Veldt Grass or Evening Primrose without damaging the tagasaste seedlings.

Physical grading was also trialed because of its potential to provide excellent weed control without the use of herbicides, however it does involve severe soil disturbance.

Key points

- Use Touchdown BA at 1.2 L/ha + simazine (500 g/L active ingredient) at 4 L/ha for best overall results.
- Avoid using knockdown herbicide only.
- Consider grading on nonexposed dunes only. Do not grade soil on exposed dunes due to erosion and drift removing or burying seed or sand blasting of seedlings.

Evening Primrose sites

- Use Touchdown BA @1.2 L/ha + simazine (500 g/L active ingredient) at 4 L/ha for best overall results.
- Consider grading on nonexposed dunes only. Don't grade soil on exposed dunes due to erosion and drift removing or burying seed or sand blasting of seedlings.
- Avoid using knockdown herbicide only.
- Prepare for second-year weed control due to moderate to high likelihood of Evening Primrose regeneration.

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96/S02



The trial on the Veldt Grass site consisted of seven completely randomised replicates for all treatments. One less treatment and replicate was used in the Evening Primrose site to save space.

Plots for each treatment were 25 metres long, including an unassessed 1m buffer on each end of the plot. Herbicide treatments were sprayed on the 27/6/96 using an accurate trial plot sprayer. Grading was carried out on the 4/7/97. Direct seeding was carried out on the 11/7/96.

Assessment was made by counting tagasaste seedling numbers in each plot for pre-summer results on the 29/11/96.

A post-summer assessment was also intended but most emergent seedlings were destroyed over summer by a combination of rabbits, sheep, grasshoppers and cockchafers.

Long-term weed control of annual and perennial weeds was also assessed by determining the 'weed regeneration potential' of each treatment approximately 12 months after the treatments were applied (10/6/97). This was done using an observation scale of 0–5, where 0 = no live weeds present and 5 = total weed regeneration of large numbers of seedlings.

The trial on the Veldt Grass site consisted of seven completely randomised replicates for all treatments. One less treatment and replicate was used in the Evening Primrose site to save space.

Plots for each treatment were 25 metres long, including an unassessed 1m buffer on each end of the plot. Herbicide treatments were sprayed on the 27/6/96 using an accurate trial plot sprayer. Grading was carried out on the 4/7/97. Direct seeding was carried out on the 11/7/96.

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Table 1. Treatments used on the Veldt Grass site

1. Touchdown BA~ at 1.2 L/ha only (control)
2. Treatment 1 + simazine (500 g/L active ingredient) at 2 L/ha
3. Treatment 1 + simazine (500 g/L active ingredient) at 3 L/ha
4. Treatment 1 + simazine (500 g/L active ingredient) at 4 L/ha
5. Treatment 1 + simazine (500 g/L active ingredient) at 5 L/ha
6. Graded strip 1.8m wide

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Contact Gerald Martin
Producer Research Support Coordinator.
Tel 08 8556 2900 or
producersupport@mla.com.au

96/S02



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Table 2. Treatments used on the Evening Primrose site

1. 2,4-D amine at 1.2 L/ha only
2. Treatment 1 + simazine (500 g/L active ingredient) at 2 L/ha
3. Treatment 1 + simazine (500 g/L active ingredient) at 3 L/ha
4. Treatment 1 + simazine (500 g/L active ingredient) at 4 L/ha
5. Graded

Discussion

Grading

The grading treatment was successful to some degree on mid slopes and swales but not on steep dunes and requires a reasonable amount of tractor horsepower. The potential problems of wind erosion and sand blasting the seedlings raise doubts with this treatment.

Farmer experience suggested that providing a site has adequate moisture, nutrition, is weed free, soil wetter was applied, frosts were not damaging and rainfall was consistent after planting, there was no difference in the result achieved from different planting methods.

Veldt grass site

The perennial weeds that regenerated at each site were almost exclusively the original dominant site weeds - Veldt Grass or Evening Primrose. There were no significant differences between any treatments.

Touchdown and simazine applied at 4 L/ha appeared to be the best and grading the worst. The seed in the graded plots may have been buried with blown sand or been scoured out.

Overall plant survival was lower than expected. The site was exposed to strong southerly winds. This may have contributed to the poor results.

There was also some evidence of rabbits being present on the site which may have contributed to the results, despite attempts to control them.

In terms of seedling numbers, there were no significant differences between any treatments.

There was a trend for Touchdown + simazine at 4L/ha to have the most number plants/25m and grading to have the least. Touchdown on its own produced results as good as any other treatment.

However, in terms of long-term weed control, Touchdown + simazine at 4–5 L/ha and grading were the best Touchdown only, provided no long-term weed control as expected. The lower rates of simazine (1–3 L/ha) were also unsatisfactory.

Taking plant numbers and long-term weed control into account, Touchdown + simazine at 4 L/ha was providing the best overall results on this Veldt Grass site.

The use of this treatment may avoid the need for second-year weed control without compromising seedling numbers.

96/S02



Evening Primrose site

Touchdown only was significantly worse than all other treatments, indicating that longer-term weed control is essential on primrose sites like this.

There were no other significant differences, indicating that, at this stage, even the low rate of simazine is satisfactory.

As on the Veldt Grass site the number of surviving plants was lower than expected. The site was not exposed to strong southerly winds but there was more evidence of rabbits being present on the site, despite attempts to control them. This was likely to have contributed to the results.

Touchdown only was significantly worse than all other treatments, indicating that longer-term weed control is essential on Evening Primrose sites.

There were no other significant differences, indicating that even the low rate of simazine is satisfactory. However, post summer results may have been different due to possible differences in long-term weed control.

The grading treatment may have worked better on this site because it was less exposed than the Veldt Grass site.

In terms of annual weeds, Touchdown with all rates of simazine and grading provided at least reasonable levels of long-term weed control.

Touchdown on its own provided no long-term weed control as expected. However, in terms of perennial weeds (Evening Primrose) no treatments were providing effective long-term weed control.

Taking into account plant numbers and long-term weed control Touchdown + simazine at 4 L/ha and grading were providing the best overall results on this Evening Primrose site. However, according to Dalton 1993, second-year weed control may be required to maximise growth rates of tagasaste.

The results of this work has been discussed with the farmer group members and there were paddock demonstrations planned for 1998.

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