Erodium control of doubtful proposition

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Available at: https://researchlibrary.agric.wa.gov.au/journal_agriculture4/vol20/iss2/7
Two species of erodium (wild geranium) are common in the pastures of Western Australia. Erodium botrys (above) grows in medium to low rainfall areas but it is usually Erodium moschatum (right) which is found in the cooler, wetter regions.

By G.W. Anderson* and A.J. Charlick*, CSIRO

Erodium (wild geranium) is a common plant in pastures of Western Australia and the seeds often cause problems by increasing vegetable fault in the wool clip. However, erodium can be a very useful component in the pasture, particularly when there is a “false break” to the season. The seedling quickly develops a strong tap-root which enables the plant to survive when most other species die from lack of water. The nutritive value of erodium is close to that of grasses. When conditions favour erodium, it may dominate a pasture to such an extent that the clover is suppressed; soil nitrogen levels are reduced and subsequent crops will be affected.

Earlier work by Drs Graham Arnold and David Barrett showed that spraying in autumn with paraquat (trade name Gramoxone) could increase the proportion of clover in pastures but total production was often reduced. We wanted to see whether paraquat could be used to control erodium and whether livestock returns could be increased enough to cover the costs of the spray.

The site chosen for the experiment was on the property of Mr R. Ladyman at Katanning. The soil was a sandy gravel and the proportion of erodium (mainly Erodium botrys) in the pasture had been high for several years. Pasture composition was measured in May and four plots were selected, each of 2 ha, on which pasture composition was fairly uniform. At the beginning of June, after the area had been grazed heavily, two plots were sprayed with Gramoxone (700 ml per ha). The other two plots were left unsprayed. The cost of the chemical today would be about $3 per ha and a similar cost would be incurred in applying it.

Sheep were removed from the plots when they were sprayed and were not re-introduced until September, when a large flock was allowed to graze all plots simultaneously. In the following April, each plot was stocked with 18 recently shorn, pregnant Merino ewes at nine sheep/ha. They lambed on the plots and their lambs were weaned in October and the ewes shorn the following April.

Both the ewes and the lambs were weighed periodically. Samples of fleeces, bellies and skirtings were taken from each ewe and analysed for vegetable fault, yield and fibre diameter.

Before spraying, erodium and the various grasses comprised more than half of the pasture herbage. The Gramoxone killed everything but the clover so that six weeks after this treatment the sprayed pastures had 98 per cent clover while the control pastures had 50 per cent clover. This change in composition had some striking effects. One was that only clover seeds were produced that year on the sprayed pastures but total production was often reduced. We wanted to see whether paraquat could be used to control erodium and whether livestock returns could be increased enough to cover the costs of the spray.

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have been gained if sheep production had been measured for the 10 months following spraying but this was not possible because suitable sheep were unavailable. One possibility for this technique is in ley farming systems. It may be possible to spray the pasture the year before cropping to increase clover content and reduce subsequent nitrogen fertiliser inputs. However, for longer terms control of erodium in pastures spraying in at least two successive years, which would considerably reduce the pool of hard seeds, appears to be essential.

plots. By June of the following year, however, erodium was again evident in the pasture. The reason for this is that erodium, like clover, has hard seeds, and enough of these had softened and germinated to regenerate the species. On the other hand, the grasses and capeweed remained at low levels on the sprayed plots. At this stage, although the sprayed pastures were clover dominant they had only 70 per cent as much pasture available as control pastures. This difference disappeared by October.

Another effect of the changed composition of the pastures was that the crude protein contents of all non-clover species were higher on the sprayed plots. This was because the clover was fixing a lot of nitrogen but there were less plants competing for it.

These differences in crude protein concentration in the plants still existed in August two years later. By this time the botanical compositions of the pastures were again similar. The ewes on the sprayed plots benefited from the extra protein in the feed. In early December, in the year following spraying, their weight was 55 kg compared with 51 kg for the ewes on the unsprayed plots. By shearing the following April the weights of the two groups of sheep were 44 and 41 kg. Lamb weaning weights were the same on both treatments.

Wool growth was also affected. Ewes on sprayed plots produced 2.32 kg per head with a fibre diameter of 21.4 microns compared with 2.17 kg at 20.8 microns on the unsprayed plots. However, vegetable fault was higher in the bellies and skirtings of ewes on the sprayed plots owing to the large number of clover burrs.

From these results it is clear that erodium can be reduced by spraying, but only in the year of spraying. However, the economics of using this technique are doubtful as it did not reduce vegetable fault and the increased wool clip was not enough to pay for the spray. Perhaps additional returns would