

IMPACT OF LUPINOSIS ON SHEEP GRAZING LUPIN STUBBLES

IN NORTH-EAST VICTORIA

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SUMMARY

In north-east Victoria 171 producers were personally interviewed to determine their attitudes to grazing stock on lupin stubbles. A sample of their lupin stubble was rated on a scale of 1-5 for infection by the fungus *Phomopsis leptostromiformis*. Although over 40% of stubbles had high phomopsis ratings few confirmed stock deaths from lupinosis occurred. This was despite seasonal conditions considered suitable for toxicity to occur.

Although there were known risks from lupinosis over 75% of producers considered lupin stubbles to be "good" to "very good" stock feed. Management strategies have evolved in the region which could well have minimised the risks of lupinosis. Of 43 producers, 35 with stubble ratings over 3 (3 is unsuitable for grazing without careful observation) utilized the stubbles, with 32 offering alternative feed at the same time.

The few confirmed sheep losses in 1981 were far outweighed by possible profits from the productivity gains achievable on lupin stubbles. Further work is necessary to determine whether this low level of toxicity will be a continuing feature in north-east Victoria or whether toxicity will increase to levels noted elsewhere.

INTRODUCTION

The area sown to lupins in north-east Victoria has increased rapidly from 200 ha. in 1974/75 to an estimated 9,500 ha. in 1980/81 (K.A. Boundy personal communication). The increase has been due to high profitability in the lupin industry and successful marketing initiatives.

When lupins are harvested some grain is spilled on the ground due to pod shattering. Research at Rutherglen (Roberts unpublished) has shown that increases of between 10 and 40% of lambs born have been achieved with ewes joined on lupin stubbles compared to dry annual pasture. For producers to achieve similar increases they must also manage their stock so as to minimise the risk of lupinosis.

Ovine lupinosis is a mycotoxicosis caused by the ingestion of the fungus *Phomopsis leptostromiformis* growing on lupin plants (Van Warmelo *et al.* 1970). The symptoms of this have been well documented elsewhere (eg. Gardiner 1975).

It has generally been considered that the fungus produces toxin after summer rain and recommendations have been to remove sheep after rainfall (Gardiner 1975). However, Allen *et al.* (1980) have shown that the stubble can remain toxic without any summer rainfall, and that the stubble can remain toxic for at least 17 weeks. Other factors

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which may cause toxicity are humidity, dew and cloud cover (Gardiner 1975, Allen *et al.* 1979).

In Victoria, the dangers from lupinosis are well publicised but little is known about the severity of lupinosis and producers attitudes to grazing the stubble with stock.

SURVEY OF PRODUCERS WITH LUPIN STUBBLES

A survey of all lupin growers in north-east Victoria was conducted in January 1981 to monitor the incidence of lupinosis. This survey included questions about area of crop, species of lupin planted, type and numbers of stock grazed on stubbles and farmer attitudes to lupinosis. In addition, a sample of lupin stubble was collected from every paddock of lupins and rated on a scale between 1 and 5. On this scale less than 1.5 is considered safe for grazing sheep, 1.5-2.0 relatively safe for one to three weeks with regular observation, 2.1-3.0 is possibly safe with regular observation though not recommended, whilst 3.1-5.0 is definitely not recommended for grazing (Allen *et al.* 1978).

Following this survey, a telephone interview was conducted to identify the grazing strategies being used by producers, to determine any common approach deemed to reduce the impact of lupinosis.

In all, 171 producers took part in the initial survey, and lupin stubble samples were collected from 336 paddocks which represented 8,396 hectares of lupin crop. Of these 171 producers, 43 took part in the second telephone interview.

LUPIN STUBBLE GRAZING

The lupin stubbles assessed in the survey included 1,212 ha. of *Lupinus albus* (cv Hamburg) and 7,184 ha. of *Lupinus angustifolius* (cs Unicrop, Uniharvest). Samples from all 336 paddocks were rated for *phomopsis* infection.

The stubbles from *L. albus* were all below 0.8 and therefore sheep grazing them were regarded as having little risk from lupinosis (See Table 1). In contrast, only 11.5% of *L. angustifolius* stubbles were below 0.8, with a further 16.9% having ratings less than 1.5. In total 52.5% of *L. angustifolius* had ratings above 2.0, with 17.6% being above 3.0.

TABLE 1 Ratings of *Phomopsis leptostromiformis* infection on lupin stubbles in N.E. Victoria

Rating	Number of Crops	% all crops
<i>L. albus</i> 0-0.8	75	22.3
<i>L. angustifolius</i> 0-0.8	30	8.9
0.9-1.5	44	13.1
1.6-2.0	50	14.9
2.1-3.0	91	27.1
3.1-4.0	42	12.5
4.1-5.-	4	1.1

Despite extensive publicity about potential dangers from lupinosis, over 50% of producers considered that lupin stubbles provided "very good" grazing (Table 2).

TABLE 2 Producers attitudes to value of lupin stubbles for grazing

	% Response
Very good	51
Good	26
Fair	5
Poor	1
Do not know	12
Did not answer	5

This may have been due to a low incidence of lupinosis over a number of years as only 18 producers had confirmed losses from lupinosis in the previous two years. A further 10 thought they might have had sheep deaths from lupinosis, no producer considered he had lost cattle from lupinosis. On the properties surveyed there were only 3 properties with confirmed lupinosis, each case involving only 1 or 2 sheep.

GRAZING STRATEGIES

In 1981 very heavy summer rains covered most of north-east Victoria providing conditions thought to lead to lupinosis (Gardiner 1975).

The possibility was raised that the grazing strategies on lupin stubbles may have resulted in fewer deaths from lupinosis, rather than a low level of toxin in the stubble. The grazing management of 43 producers with stubbles rating higher than 3.0 in the initial survey was examined. Despite having been given a rating on the stubble only 8 did not graze stock on the paddocks.

Of the remaining 35, only 3 did not offer alternative grazing to their stock and one of these had a confirmed sheep death from lupinosis.

The management of the alternative feed source varied. It was always either dry pasture or a cereal stubble, and it was in the same paddock or with access through an open gate. No producer had a policy of regular shifts from the lupin stubble, and only 3 removed stock after heavy rain. Careful observations of sheep on lupin stubbles was not a key factor as only 13 of the producers observed stock more frequently when on lupin stubble than was normal at pasture.

An additional factor may have been the green pick available in almost all lupin stubbles following the rainfall.

An indicator of producers' impressions of lupin stubbles for grazing can be gauged from the fact that every producer in the second survey would run stock on the stubble next year.

CONCLUSION

In a year when stock, particularly sheep, were at risk from lupinosis due to heavy summer rainfall and high stubble ratings for *Phomopsis leptostromiformis* there were only a few confirmed deaths from lupinosis in north-east Victoria.

A number of reasons may account for this:

- (a) the lupin stubble does not develop the high toxicity levels of other areas, for example Western Australia (Arnold *et al.* 1978).
- (b) producers have developed livestock management practices which can adequately offset risks of lupinosis for example, low stocking rate, alternative feed source - stubble or dry pasture (also green pick in 1981).

Productivity gains have been demonstrated from grazing lupin stubbles, particularly from joining ewes on the stubble. Turnbull (personal communication) showed that up to 11% of ewes can be lost from lupinosis before the gains due to lambing are eroded.

These results cover only one year. There is cause for some concern that outbreaks may become more severe in the future. However there is also cause for optimism and future work must concentrate on developing the productivity aspects of lupin stubbles in north-east Victoria. Concurrently, a test must be developed to accurately monitor toxicity levels of stubbles. Although management strategies currently seem to cope with the problem in north-east Victoria, research is needed to develop strategies which further minimise losses.

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