Paper 20
LUCERNE FOR THE 80'S
CONCLUSIONS FROM THE SYMPOSIUM

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INTRODUCTION

Many important problems have been solved or defined during the period since the last major lucerne review in 1967. Recommendations can be made from the solutions which will be useful for farmers.

The opening address by Dunbier, Wynn-Williams and Burnett told us that the lucerne area had declined during the later part of the 70's, and suggested as reasons causing this decline, the high rainfalls of the late 70's, the introduction of pests — blue-green aphid, pea aphid, Sitona weevil, or the spread and increased intensity of pests and diseases — stem nematode and bacterial wilt. They also suggested that lucerne had been oversold in the late 60's and early 70's, and pushed into districts less suited for it.

They pointed to the maintenance of lucerne in the Central North Island as an exception to the general decline. I have thought of the Central North Island, with its higher rainfall, as a marginal area for growing lucerne. I think the lesson to be drawn is that because it is a marginal area, and because dairy farmers are accustomed to using closely controlled grazing systems, they have evolved management systems which cater for lucerne's needs, but allow them to take full advantage of its extra summer production. South Island please copy.

As far as could be determined, farmers are keeping lucerne stands down for about as long as they did when surveyed in 1968 by Blair. The decline in area may come largely from failure to re-sow lucerne as stands run out, rather than a sharp decline in stand life.

CULTURE

Establishment

Wynn-Williams reviewed work on lucerne establishment. He pointed out that the effects of competition from weeds and cover crops on seedling lucerne are now well understood, and are usually temporary, and considerable savings can be made by sowing with cover crops. However, this is not usual outside Canterbury and Marlborough. He also pointed out that farmers usually sow about twice as much seed as they need to.

Comments by advisers that these cost savings would not work outside Canterbury and Marlborough, or otherwise farmers would be using them, gives a new slant to the research-advisory-production pathway. I am sure that more extension rather than more research is needed on this subject. The principles are well understood.

Sowing in September-November has been shown to be superior to earlier or later sowings. However, even in good conditions, only about 50% of the seeds sown produce plants, and this subject may warrant further research. The effects of pelleting for conventional sowing were not clear, but pelleting could be an expensive way of buying lime. Problems of sowing lucerne directly after lucerne are still undefined, and results unpredictable.

Musgrave looked at non-arable establishment. To him pelleting was highly advantageous, and establishment by overdrilling after a vegetation kill, can be highly successful if the correct equipment is used.

Establishment rates from oversowing are still very low, and the practice cannot yet be recommended.

Weeds

Palmer quoted a large number of reports supporting the view that weeds occupy vacant space in lucerne stands and do not compete with lucerne, and that herbicide treatment reduces total feed production, especially over the winter-early spring period, reduces feed quality, and has only temporary effects on lucerne production. Farmers were reluctant to agree with this view, and thought that removing weeds increased lucerne production.

Whichever view is taken, the annual weeds which infest lucerne, and particularly barley grass, were acknowledged to have undesirable features. Search for useful plants, compatible with lucerne, to fill the gaps was

suggested. In the higher rainfall districts only, ryegrass can be sown or will establish naturally.

In the South, grass/lucerne mixtures were well advocated and tried twenty years ago, but fell from favour because of the difficulty of maintaining a productive lucerne/grass balance. The approach deserves renewed research, especially with the newer grass and lucerne cultivars now available.

Butler listed chemicals useful for weed control in established and newly sown lucerne. He too, emphasised the need for a companion plant to prevent the ingress of weeds into established lucerne. He pointed out the necessity of dealing with perennial weeds before sowing lucerne, for seedling lucerne does not compete well with weeds.

I am not as convinced as he is, that money is well spent on post-emergence weed control in seedling lucerne. Seedling lucerne is so sensitive to most herbicides that it cannot be sprayed until weeds are already well established, competitive and hard to kill. Effects of removing annual weeds are only temporary. It may pay to give lucerne the full treatment of Treflan before sowing if high first-year production can be expected. Often when sowing, farmers choose the least profitable option of no weed control, or post-emergence spraying, instead of using Treflan or sowing with a cover crop.

PATHOGENS

Insects

Kain and Trought gave new information on life histories of Sitona weevil and the aphids. They showed how the aphids can be controlled to a large degree by winter grazing or spraying, and suggested that Sitona may be controlled by an early winter treatment.

Certainly aphids can be cheaply and easily controlled, and autumn infestations which are allowed to carry through the winter very seriously lower lucerne production in spring. As yet, it is not known how much harm Sitona grubs do to lucerne.

There was considerable farmer and advisory officer enthusiasm for Sitona as the major lucerne pest, but little evidence from scientists supporting this view. As Trought remarked, now that we can control the beast we should be able to assess its importance.

Diseases

Close, Harvey and Sanderson described recognised diseases of lucerne, with some attempt at assessment of their relative importance.

The best evidence on this question was given by Dunbier and Easton. Trials with cultivars resistant to several diseases have shown clearly that bacterial wilt is the main disease affecting lucerne in the Central North Island, and that Phytophthora root-rot causes severe stand loss in wet soils and under irrigation. These are new findings, and useful to farmers who can now grow resistant cultivars.

Resistant cultivars give good control of nematodes too. For these three diseases they are the only methods of control, and they are very effective. In the absence of disease and pest, the new cultivars are as good as the old ones. Cultivars resistant to these diseases are here now. Farmers do not need to delay sowings until they arrive, and insect pests can be controlled by sprays or grazing management.

Leaf diseases can be rampant in wet seasons. They cause leaf loss, which is usually not serious, but they induce the lucerne plant to produce the coumestans which lower lambing percentages. They can be controlled at tupping time by arranging a supply of young regrowth for ewes. Jagusch showed that clean lucerne regrowth is better tupping feed than pasture. Dunbier showed that some of the new cultivars, such as Saranac, WL318, WL311, and PR524, are more resistant to leaf diseases than Wairau and Washoe, and so are better flushing feed. Farmers should be able to use these findings to increase their lambing percentages.

There is a complex of other root and crown diseases, known collectively as crown rot. This is very widespread, and has been around as long as I can remember. There were various opinions about its causes and effects. This would not matter much to farmers, except that the winter grazing recommended for aphid, Sitona and weed control is said to increase the incidence and severity of crown rot. There was no evidence presented to convince me that crown rot was important, or that winter grazing increased it. I would opt for the weed and insect control and winter graze.

There was also some divergence of opinion about the effect of winter grazing on dry matter production. Smallfield reviewed this subject. Two research workers had results which suggested that grazing in mid-winter merely took off feed which would otherwise be rubbed off by frost, while another had results to show that leaving lucerne ungrazed all winter produced as much total usable feed and more spring feed. The subject needs more work, especially with more winter active cultivars such as AS13R and Rere, which begin growing earlier in spring, and will be more sensitive to winter damage. Until this is done, I would choose the short sharp mid winter grazing advocated by White for weed control and by Trought for insect control.

It was fairly plain from questions and comments that most farmers and advisory officers cannot diagnose lucerne diseases as well as they should be able to. Now that something effective can be done about several pests and diseases, it is important that farmers and advisers be able to diagnose their problems correctly so that they can apply the right treatments. It is not much use treating for Sitona weevil if stem nematode is the problem.

Similarly many of the plant pathologists have not done very well at assessing the relative importance of the several pathogens they find on lucerne. These mistakes have delayed the adoption of useful control measures in all districts, but particularly in the Central North Island.

In summary, there has been very good progress with the disease and pest problems of lucerne. Not all problems

have been defined or solved, but major ones of stem nematode, bacterial wilt, Phytophthora root-rot, aphids and Sitona weevil are now controllable.

UTILISATION

There has been some progress towards better grazing systems. Lucerne needs short grazing periods, and long spells between grazings. Set stocking can cause very rapid decline in lucerne vigour and productivity, and leads to rapid death of lucerne plants and weed invasion.

The sheep need feed when they are hungry, which is not always when it is available. Lambing to weaning is the most difficult time. Animal demands are high, lucerne is just getting into its stride, and ewes and lambs should be left undisturbed.

Janson mentioned work which suggests that there could be a considerable easing in the situation, without great harm to the lucerne, by having animals on lucerne for up to a fortnight at a time before shifting. This is considerably longer than the commonly recommended 6 days on, 6 weeks off, or its near variants.

Unfortunately, he did not produce sufficient evidence to convince me about the generality of this result. If it is generally true it is very important. It needs verification under a range of stocking rates and conditions. In the meantime, farmers should try to stock with conventional short grazing periods.

There is need for more information about grazing management. Some valuable research work has not been published. This sort of research is expensive, and results should be published for criticism and adoption before more is advocated.

From general "over the fence" observations, poor grazing management, with continuous set-stocking for long periods, is common in Canterbury, and is without doubt a major factor causing poor production from lucerne. Lucerne grazed like this probably produces less than grass/clover pastures, and has a short life.

In Otago and South Canterbury, they usually do better according to Talbot and Brosnan. In North Otago stem nematode has been severe. Farmers there should be trying again with Washoe and AS13R, which are highly resistant to nematodes.

The most interesting paper in utilisation came from Mace at Rotorua. Dairy farmers on the summer-drought prone pumice soils have no doubts about the value of lucerne, and continue to sow more of it. They have evolved grazing systems which take full advantage of lucerne's extra and more certain summer production. Mace attributed a large part of the increasing dairy production in the district to lucerne. On average, lucerne there produces 50% more than pasture, and on coarser soils up to 130% more.

Overdrilling, and sowing with grasses, have been unsucessfully tried to overcome the winter low in lucerne production, but farmers there now try to keep their lucerne pure for as long as possible, usually about four years. It is then overdrilled with ryegrass, and within another three to four years becomes ryegrass-clover pastures. The winter feed gap is filled by lucerne hay or silage, grass pastures, or swedes or kale which fit well with the lucerne renewal programme. Later calving has taken the pressure off in the spring. The average lactation period is only 7½ months. The cows are given a new break of lucerne each day in the grazing season. It all sounds like good news for the farmer, his cows and the lucerne.

The discovery that sodium content of lucerne is low, and that salt supplements increase milk production or animal growth rates very considerably has helped lucerne in the area.

The two Canterbury farmers and advisers spoke more on the problems of growing and using lucerne, than about its advantages.

I think 30" or 750 mm is getting on the wet side for lucerne. The average yearly rainfall at Lincoln is 25" or 625 mm. Since 1973 it has averaged 31" or 780 mm, with one year over 900. At Ashley Dene, once the show place for lucerne in Canterbury, the ground water table rose to flood many paddocks, and only now is lucerne recovering from this. At Mt Somers where Lewthwaite farms, rainfall over the same period has averaged 1020 mm instead of the average 890, rising in 1978 to 1300 mm.

Many of the recent problems with lucerne stem from this one root cause. Other recent problems — bacterial wilt, stem nematodes, aphids, Sitona weevil — can now all be controlled. Farmers should remember that dry years do come again. Some will be remembering already. They need have no doubts if they sow the right cultivars and manage them well.

The evening session addressed by R. Ensign from Idaho, and B. Koller talking about a N.Z. aid project in Peru was interesting, and with lessons for the present state of lucerne-growing in New Zealand.

In Peru they have a very long dry period and soils with a sub-surface water table which the lucerne can tap, and the weeds can't. Also, they have just begun growing lucerne and have not yet built up any pest or disease problems. Lucerne is productive and long-lasting, and it doesn't matter too much what cultivars they grow. This is in many ways similar to the situation in New Zealand twenty years ago.

On the other hand, in the U.S.A. they went through their bad patch in the twenties and thirties, with a build-up of lucerne diseases and pests. But since about 1950, and the release of resistant cultivars, lucerne area has rocketed. About 12 million hectares of high-producing lucerne grown in short rotations of 3-5 years supplies most of the protein feed for the nation's dairy herd.

REFERENCE

Blair, I.D. 1968. Deterioration (running out) of lucerne in the South Island. *Proceedings 21st N.Z. Weed and Pest Control Conference*: 38-48.