CHAIRMAN'S SUMMARY

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In this summary I do not intend to cover in detail all the current information available on ryegrass staggers, because most of it can be found by reading the ten papers presented in the session. Instead emphasis will be placed on many of the interesting points raised in the discussion and on areas where we lack information or where there are real or apparent differences of opinion.

Costs and incidence in North Canterbury

Both Phil Everest and Bob Hewett showed that the disease was the single most serious animal health problem affecting the district with total direct and indirect costs ranging from $2–$10/head. As pasture development proceeds and grass dominance changes from species like danthonia and browntop to perennial ryegrass, the disease becomes increasingly severe particularly on the more intensively stocked farms.

It is worth noting here that this is the situation described by Sears (1960) in his 5 phases of pasture development, and that ryegrass staggers is correctly described, because it has not been recorded on other grasses such as browntop (Lancashire & Ulyatt 1974). cocksfoot or prairie grass (M.J.Byford, unpublished) and the bred tall fescue Roa (Anderson 1982) does not contain any endophyte (G.C.M.Latch, pers. comm.).

Symptoms and Causes

These are well described by Peter Mortimer, Ian Harvey and Lester Fletcher and confirmed the original Lincoln observation of a strong association between the *Lolium* endophyte fungus and the occurrence of the disease. A movie film of affected sheep was a useful guide for the audience but a number of farmers considered that- it did not really show how completely incapacitated severely affected animals can become. In other words Keogh's (1973) classification ought to include a score of 6 to cover this situation (R.G.Keogh, pers. comm.).

There was considerable discussion on factors affecting the occurrence of the disease (or expression of the symptoms) in any particular year. Local farmer Julian Dillon said that there was considerable unexplained variation between years, although the incidence was generally worse when the pasture died right off. Bob Hewett felt that climate – high ambient temperatures and dryness of herbage was more important than the state of the pastures, while Jim Douglas made the important point that very high endophyte levels and close grazing were a feature of winter pastures at Ruakura yet no staggers occurred at this time of year. A number of farmer speakers observed that sheep affected with staggers were much easier to move in the cool of early morning when symptoms were less obvious, rather than later in the day when temperatures were higher. The apparent amelioration of symptom expression (or the disease) by drenching affected sheep with water or a proprietary mineral drench raised by local farmer Noel Davis, John Toxopeus and Bob Hewett, may also work by exerting a cooling effect, but other farmer speakers felt that access to plenty of water was of no benefit.

This discussion showed that general field observations of the disease could be extremely illuminating, very confusing and conceivably quite up the creek, but given the complexity of the field situation this was quite understandable. It is certainly important to emphasise, as Mike Smetham pointed out, that if the disease takes 7-14 days to develop after the animals have been placed on toxic pasture and information on elimination of the toxin is lacking, then a very full description of the pasture and animal situation during outbreaks in the field is necessary if the issues are to be clarified.

Cultivars, Seed and the Endophyte

Garry Latch and Don Scott demonstrated clearly that it is quite possible for seed lines low in endophyte to be made commercially available to farmers. However, it is not clear how long this pasture will remain relatively free of endophyte (and staggers), but given the permanent nature of most New Zealand pastures it seems inevitable that all old perennial ryegrass swards will eventually become infected with endophyte and thus a source of the disease (this is apparently confirmed by the fact that Argentine stem weevil is rarely a problem in old pastures). The reverse situation of artificially infecting low endophyte seed lines to raise their level of endophyte has not yet proved technically possible, but in the field, hay from high endophyte paddocks fed out on low endophyte pastures will probably achieve this objective.

Endophyte and Argentine Stem Weevil

The problem of control of ryegrass staggers is complicated by the discovery that ryegrass plants low in endophyte are more susceptible to damage by Argentine stem weevil. David Gaynor and Warren Hunt summarised their experiments and other available data and the discussion emphasised the dilemma faced by farmers. The pest can have a very destructive effect on young pastures although the impact on animal production has yet to be determined. A common opinion expressed by a Waipara farmer was that 'grass is needed to grow sheep and that we can live with staggers as long as herbage continues to grow'. On the other hand Lester Fletcher presented data which suggested- that even in the absence of staggers high endophyte ryegrass may produce pastures which reduce animal liveweight qain compared with low endophyte pastures. This observation needs to, be confirmed, but it is interesting that poor animal performance in the USA on tall fescue (C.S.Hoveland pers. comm.). has been associated with the presence of endophyte in that species.

John Hayman brought up the point that attacks by Argentine stem weevil may, by natural selection, produce a pasture which is high in endophyte. Peter Mortimer confirmed this suggestion with data which showed that a pasture containing 3% plants with endophyte had increased to 75% after a severe attack by the weevil. Ian Harvey suggested that all drought tolerant ryegrass lines were high in endophyte, while David Gaynor emphasised that although the incidence of Argentine stem weevil was well documented in Waikato, Wairarapa, Manawatu and Canterbury, little was known about its importance in other regions of the country. However, he had recently seen some adults outside the Wesley Centre (the conference venue). There were clear differences between North Island and South Island conditions with Canterbury having a late spring/ early summer peak of weevil populations compared with a later summer peak in the North Island. Regional differences were also emphasised by Ian Harvey who had measured much lower endophyte levels in mid-winter in Canterbury than those found in Waikato.

Control of the disease

Much of the discussion centred around the value or otherwise of grazing management techniques. The avoidance of close grazing through rapid rotational systems to reduce the ingestion of basal sheath material and the endophyte, proposed by Reg Keogh, was not universally accepted. It was argued by several local farmers that this did not work under North Canterbury conditions where feed was always short in dry summers. Once animals were affected by staggers it was not possible to move them on a daily basis and a dairy adviser suggested that set stocking at a low stocking rate without disturbance was the only answer for dairy stock. The discussion certainly emphasised the importance of definition, because broad terms such as rotational grazing and set stocking are not precise enough in relation to herbage height to be usefully relevant to the control of staggers. Also any grazing management system involving stock movement must be instituted at the very first hint of staggers or it becomes almost impossible to carry out. Bob Hewett's discovery that particular genetic lines of sheep are relatively resistant to staggers offers a long term solution to the disease, and opens up a large area of investigation on the mechanisms of disease tolerance/ avoidance in grazing animals.

Finally, any management procedures which encourage greater clover growth in pastures during summer and autumn will decrease the incidence of the disease, while pasture mixtures for dryland which contain drought tolerant grasses such as cocksfoot, tall fescue, prairie grass and possibly phalaris can offer farmers permanent pasture which is a non-staggers alternative to perennial ryegrass. A further advantage is that most of these grasses are relatively tolerant/resistant to Argentine stem weevil.

REFERENCES

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