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Legumes for profitable, high quality forage

There appears to be little that an individual farmer can do about the price paid for livestock products given price pressures from cheap imports and a fall in consumer demand. Nevertheless, a way forward must be found by farmers to preserve an economic and healthy livestock industry.

A more extensive farming system with lower inputs is widely predicted. Growing lower cost forage will reduce the cost of production. For such a system to be successful it will need to provide much of its own protein and nitrogen. This will have the immediate effect of reducing variable cost expenditure by reducing bought in feed and fertiliser. Ultimately this will lead to increased gross margins and healthy profit-and-loss accounts. Fine words we hear you say, but how can this be done?

The Answer

The way to lower forage production costs is to fully utilise legumes such as clovers and to graze as much as possible. Legumes have become less popular in recent years as fertiliser use has increased. However, legumes could still supply more than enough nitrogen for most systems if they were called upon to do so. Legumes are also an excellent source of protein for the ruminant animal.

Our research scientists have been evaluating methods of using legumes for forage for many years. Most of this work has concentrated on white clover. Work at the Scottish Agricultural Colleges and the Institute of Grassland and Environmental Research has time and again demonstrated that more extensive clover-based farming systems can be profitable. Many farms have yet to take advantage of this information, preferring instead to continue growing mono-crops of ryegrass and extensively using artificial nitrogen. Now difficult financial circumstances focus our minds on the need for change.

Sources of Protein

In the UK about 85 per cent of ruminant protein from homegrown crops is from grass. Most of this is in the form of grazed grass as opposed to grass silage. The various, alternative crops such as maize, cereals and peas make only a trivial contribution and it is unlikely that new protein crops will become available. In the light of this it becomes obvious that we should concentrate on how grass-based leys could be enhanced to produce more protein. Improving the quality of grazing and grass silage is likely to be the best way of increasing profitability in the immediate future.

The use of grass leys containing legumes will increase the quality of forage and the intake of material by the animal. Ruminants will consume 20-30 per cent more forage when offered legume forage compared with pure grass and this is not the whole story as the available protein in legume silage is much greater. Losses in ensiled grass leave only 40 per cent available protein, the rest being

degraded to ammonia and amino acids, but with well fermented legume silage the amount of protein left is 60 per cent.

Growing Protein Legumes

Legumes can be sown with ryegrass leys. White clover is generally suitable for grazing although can also be grown for silage. The more productive, but shorter-lived red clover is better adapted for silage. Both of these species can be introduced by over-seeding into existing swards but are better if sown at the time of re-seeding.

The objective with both red and white clover is to establish between 20-35 per cent in the sward. This level is adequate and will lift protein content by around 3-4 per cent. John Bax, at SAC Crichton Royal Farm in a classic research programme showed that grazed grass/white clover cost £12/t whereas grazed grass without clover, but with nitrogen fertiliser cost £18/t of dry matter.

There are also large legumes such as lucerne and sainfoin, which can also provide protein. These are generally grown as pure stands and also have low input requirements.

Free Nitrogen Here

Would you put petrol in your car if it were possible to run it on air?

All forage crops depend on the availability of nitrogen in the soil to promote growth. The use of legumes provides free nitrogen by a unique ability to fix this from the air via their root nodules. Clovers can supply over 200kg of N per hectare. This is more than enough nitrogen for most farming systems. It is very easy to justify legumes at this time with artificial nitrogen fertiliser prices being inextricably linked to the price of oil.

Legumes are also more drought resistant than ryegrass and have the added advantage of improving the soil on which they grow. They are generally deeper rooting and ploughed in leave the soil in ‘good heart’ for the following crop.

Addressing Problems

It is a recognised characteristic, particularly of white clover, that spring growth is slower than grass plus nitrogen fertiliser. This difference will be influenced by the season, with little difference in years with a mild spring. Over an eight year period the difference in turnout date on SAC’s Acrehead system was only 2.4 days later on grass/white clover swards. If it was felt that earlier growth was required, tactical applications of nitrogen fertiliser could be applied. Provided that this was limited the subsequent clover growth would be unaffected, particularly with the newer more nitrogen tolerant clover varieties. Alternatively, an area of ryegrass plus nitrogen fertiliser could be maintained for earlier spring growth.

Often comments are made that clover is included in seed mixtures but it doesn’t last. There can be many reasons for this but the most common fault is the selection of the wrong variety for the system. Also it is counter productive to apply high levels of nitrogen fertiliser and then bulk up for silage. This has the effect of quickly depressing the clover content and the nitrogen fixation benefits are lost.

Weed control is another reason cited for not including clover in leys. There is no simple solution to this. However, clover safe herbicides are available, though these need applying when weeds are small to be effective. An alternative to eradicate most annual weeds is to graze with sheep early after sowing. In addition, management techniques which include crop rotations and stale seedbeds to ‘flush’ expected weeds would help to lessen the problem.

In Conclusion

There is little new about the clover-based farming system. It was used for a great many years before the introduction if artificial fertiliser. The difference now is that we have reached a plateau in our intensification of livestock farming and put simply, the figures do not add up anymore. The time has come to take a step back and ask what do our customers want and how can we produce what they want at a cost that enables livestock farming to prosper again? If farming does become more

extensive we need to take a fresh look at legumes.

by Ian Wilkinson of Cotswold Seeds

Date Posted: 30th March 2017