

Controlling Brachypodium with grazing / Breeds and Forage

Extracts from Nibblers online discussion group

What is other's experience of the best grazing animals and timing of grazing/stocking rates etc to control brachypodium on limestone grassland?

Adam. It would be useful to have a GAP database for such queries, where one could enter a plant species and have access to information on best practice. It could start with control of problem species but could be extended to include more or less any query which regularly comes up?

Cathy W

Which species of Brachypodium - ? pinnatum ? This is quite different re. grazing compared with sylvaticum? There has been lots of work in the past on pinnatum on chalk grassland in Kent - sheep don't eat it, but cattle will. If it is this, I can look up some of the earlier work if needed.

Kind regards, Penny

Tor grass - or in FBI speak Torre grasse. Probably.

Henry

If it is pinnatum, then cattle every time. And make sure they graze now: Tor grass has a very early flush of growth, and is almost palatable by sheep at this point. In fact winter cattle grazing is very good for tor grass control where Bp has got the upper hand - poaching is more effective, and breaks open the tussocks, and it's a time when cattle will begin to eat up all that thatch. If the problem is not widespread or particularly bad, then timing is less of an issue.

Some people rate ponies for tor grass control. There are sites where they have been successful, but here at Seacombe valley (20 years of pony grazing) we have large areas pretty much untouched by ponies and other areas grazed too tightly, latrine areas and a site which has moved into unfavourable condition as a result. Cattle create a tighter mosaic.

David Hodd

goats and sheep will take b syl in late winter / early spring, ie as for b pinn when more palatable grasses are less available and when new growth coming thorough; b syl seems to be associated with scrub / woodland, i.e. under canopy though does persist in open sward (don't know how long for)

regards

Jim

Goats will also eat brach pinn seeds in summer, as observed on a number of occasions at Ventnor Downs by National Trust staff.

Jude

I imagine you are interested in *B pinnatum*, Cathy. Up here in Cumbria we have *B sylvaticum*, a similarly tough and unpalatable sp. that likes to take over limestone grassland if it gets the chance, particularly following scrub clearance. Cattle are very good at eating it back in the first half of the summer, especially if the alternatives are less than palatable themselves. The cattle are much less keen once it has seeded. I seem to remember *pinnatum* being of the same disposition from my time down south.

best wishes

Bill

Pinnatum please

Cathy

B pinnatum is not at all like *B sylvaticum* when it comes to grazing.

Cattle will dramatically reduce *B. sylvaticum* as they eat it readily whereas they do not like *B. pinnatum* and only eat it under pressure. When I was at Aston, Rowant NNR there was an area outside the fence which was grazed by a neighbour's cattle and the *B sylv* was just about eliminated on this bit in only 3 or 4 years. Even sheep will eat *sylvaticum* although they have to be pushed a bit.

To control *pinnatum* effectively it seems to me that you have to graze very hard indeed thus reducing most of the interest in the grassland. And you have to keep on doing it year on year.

We tried digging it out with a Drott at Martin and even this did not work very well.

It does seem to be an increasing problem and some Dutch researchers link it to increased atmospheric N.

On Salisbury Plain there has been a huge increase in *B. pinnatum* in recent years in both cattle grazed and ungrazed areas.

I am not optimistic about it nowadays and I do not believe that it is going to be possible to control it to any appreciable extent and that we will have to accept a change to CG5 and probably CG4.

David Burton did a lot of work on spraying *B pinnatum* at Martin Down and should be able to contribute.

Paul

It is perhaps worth distinguishing fields where there are patches of B pinnatum / CG4 communities, and those fields where there are occasionally patches which aren't. The downs in Kent (as with Purbeck) are predominantly B pinnatum, so the stock did graze it effectively. When I worked on the South Downs where B pinnatum doesn't have the stranglehold of Kent, it was difficult to force stock onto since there was other grazing to do. I do agree that if you are after a downland that looks like CG2 when there is extensive Tor grass, you have to graze within an inch of its life, for ever. But perhaps that's about what you want from the vegetation rather than the plant itself. There are some quite rich CG4 that can be achieved without looking like CG2 and they have a lot of invert interest.

B pinnatum does grow early in the year before other grasses flush and appears to do well in the hottest summers (when even sheep's fescue has burnt off).

I understand that it spreads well under burning - which may explain part of the Salisbury plain experience, and of course the vegetation communities there tend to be taller chalk grassland on deeper soils, so may respond differently to the escarpment slopes which is more or less all you get for chalk grassland outside MOD land.

David Hodd

know burning tends to increase B.pin., but it has also spread a tremendous amount on Martin Down where there has been a quite hard sheep grazing regime and no burning.

When I first went to Martin in 1978 there were just a few discreet patches. In those compartments B. pin is now widespread and very much mixed with the Bormus erectus. This is in spite of hard mowing and grazing in an attempt to control it.

I agree that there are very rich CG4s and CG5s and that in the longer term we need to manage for their interest.

It is no use trying to keep B.pin out if it is a losing battle.

No doubt there are some sites where there is so little that it can be controlled.

I sometimes think that if we had tried when I first went to Martin Down we might have been able to eliminate it.

Paul

I don't know of anyone who has successfully eradicated tor grass - attempts at Fulking on the South Downs (which has a distinct patch) were not particularly successful, and unless I am out of date, neither were attempts on Barton Hills. I would like to be corrected on this issue.

Whilst working on WIGI project, I did suggest cattle grazing on Martin - primarily on the presumption that the Tor grass will spread and sheep are pretty well ineffective on Tor grass

David Hodd

We found.....

Spraying small patches of *B. pinnatum* in herb rich chalk grassland with Roundup kills it and any other vegetation present. Re-colonisation under conditions of sporadic sheep grazing resulted in a herb rich sward including indicator species of good CG2 re-establishing after an initial couple of years with ragwort/thistles colonising bare patches amongst the litter layer left by *B. pinnatum*. Some *B. pinnatum* returned but this could be reasonably successfully controlled by spot treating with Roundup.

Mowing with removal of arisings produced a herb rich CG 5 sward...mixture of *B. pinnatum* and *Bromopsis erectus* occurring frequently in sward.

B. pinnatum's Achilles heel is that it doesn't like summer trampling (key period for it to stock up energy for year ahead) so cattle ranging through it will break it up...technique used at Wye Downs and elsewhere in Kent. Also people trampling will have a similar effect.

Down side, as Paul says is loss of structure with heavy trampling/grazing.

Cheers

David

David Burton

Land Management and Advisory Services Team

Natural England

Thanks David, so glad you are now able to join us. Your message reminded me that I had meant to comment on the cattle and *B. pinnatum* relationship when this first came round. Back in 1988 when I did my first bit of long range conservation grazing I moved my 2 Ayrshire cows with their S Devon X calves at foot and 3 older Red Poll X steers from the Forest of Dean where I was living at the time onto a place called Swifts Hill near Stroud for the Glos Trust. It hadn't been grazed for a good number of years and attempts had been made to burn it so it was pretty rank with *B. Pinnatum* and *B. erectum*. Suffice to say that all the cattle did very well. So well in fact that I was able to take the older steers straight to the abattoir where they graded very nicely as I remember. Furthermore the neighbouring farmer, having seen how well my cattle had done, despite previously having repeatedly ridiculed the idea of it ever being grazed, stepped in and took on the grazing.

So I wouldn't be totally persuaded by the idea that cattle just don't cope with pinnatum. Maybe its only those soft southern varieties that you have down Wiltshire way, Paul.

I hope nostalgia hasn't coloured my recollections too much on this one.

best wishes

Bill

This makes you wonder why they did well. It would be interesting if anyone could get a trace element analysis of the prevalent "weeds" to see if that is why they did well. I suggest this as it seems unknown if the breed of cattle matches the food source, or if it is the food source that provides the magic ingredient or maybe some breeds can benefit more from a nutrient source "weed" than others, and if so does it have different bugs in its gut to digest these weeds. If you can match your stock to the location and so finish them that would save serious money and/or increase the sale price.

If a sheep disappears into to a wood here, they get nothing to drink and no grass apparently, but always emerge fat as butter a few weeks later. Why?

Richard M

Yes people trampling - You have reminded me how successful this is. The vast majority of the downs above Folkestone were CG4, but on Creteway Down there was a large area of CG2 which had been maintained by the local kids using estate agents boards for grass sledging, and not by grazing. No anthills survived though.

David Hodd

Well Bill, I didn't know you were doing conservation grazing here in the Cotswolds back in 1988! I am with you on this one.

The sort of site that Bill has described is typical of the Cotswolds, much of the most species rich limestone grasslands are Common land and most have suffered prolonged periods of no/inadequate grazing. B pinnatum (along with Bromus erectus) is a natural component of the CG5 grasslands that are so widespread here so it is not a species I consider to be a particular bad guy. That said, where a site has suffered from neglect/regular burning/inadequate grazing it can become over dominant.

The usual mantra of using hardy breeds rather than commercial ones seems to work, although cattle are by far the most effective in my experience. The GAP we run in conjunction with the National Trust has Welsh Blacks and Belted Galloways and both do an excellent job at maintaining and restoring such sites. I am sure the trampling that you get with cattle, as opposed to sheep, also helps. I would accept that during the restoration phase you may have to run them quite hard but that can be relaxed once you have the site back in some sort of condition.

The problem then can be the "flush" of new scrub that you get, that had previously been kept in check by the matt of coarse vegetation, but that's a whole new thread!

That's just my local take on it and it may not apply so much to chalk grasslands.

Regards

Paul

I think this also flags up the fact that many livestock breeds were developed in a local area because particular strains were better suited to the grazing in that area. (Not sure about the Galloways in the Cotswolds, perhaps!)

Also, I am convinced that access to a varied diet suits the more traditional breeds, and that a large acreage of 'poor quality' (in agricultural terms) but varied grazing is better than a highly productive ryegrass sward, presumably due to various mineral balances.

It would be really interesting to get some further research into this, and also more work on comparison of different breeds for different purposes.

Cathy

Cathy Wainwright

Grazing Manager

The Wildlife Trust BCNP

Bill

I was not suggesting that cattle will not eat B. pin as I know they do.

I was saying that I do not think it is possible to eradicate it and that to even keep a very rich sward with B pi. in it you have to graze quite hard. Usually much harder that is desirable for much of the other wildlife.

What was the sward like on your site after a couple of years? How much had you "controlled" B pin?

I would be very interested in a site visit to anywhere where people feel they are controlling B pin by grazing. Please let me know.

There are dangers of generalization when it comes to different breeds and 'varied diet'. When I was running an experiment in species-rich hay meadows on a Somerset peat moor and grazing aftermath growth with Hereford x Friesian crosses, we achieved extremely good live weight gains (typically 1.0-1.2 kg/day with 300 kg cattle). Similar results have been achieved using normal commercial breeds on other species-rich pastures. However, in another study, much lower live weight gains (average c. 0.5 kg/ha/day) were typical of molinia-dominated pasture (i.e. Culm grassland or Rhos pastures in Devon and Wales) over a range of sites, even though these pastures were species-rich.

There is some experimentation being carried out by IGER in a cross-fostering experiment to compare traditional breeds with commercial ones and to see if traditional breeds are innately better at dealing with 'rough' pastures or whether calves learn this from their dams - or foster mothers, if being fostered by a dam of a different breed. The experiment is being carried out on both a molinia-rush pasture and on improved grassland. This is due to finish this year (planned to be written up by March 2008).

There is some evidence from Scotland that when traditional and commercial breeds were both put onto 'rough' (molinia-dominated) pasture, the traditional breed did better in the first year but when the same animals were returned to the pasture the following year there was no difference. The implication is that the commercial breed (Charollais, I think - I can't remember what the traditional breed was) had either learned how to forage on rough pasture or had adjusted in some other way. My memory is a bit hazy on this and I'm not sure how detailed the study was. The person responsible was Iain Wright at the Macaulay Institute, if anyone wants to follow it up. The IGER work is being done by Jerry Tallwin at North Wyke.

This is a bit off the subject of Brachypodium control, though!

Francis

Dr F.W. Kirkham

Ecological Research & Consultancy

Further to my email about native breeds and the IGER cross-fostering experiment, I see that this was actually due to finish on 31/12/2006, not March 2008 as I said. The project is presumably being written up currently, as the final report is not yet on the Defra research web site. You can find a summary of the projects aims and approaches using the following link, where you will also be able to find the final report once it has been completed and uploaded (don't hold your breath!)

http://www2.defra.gov.uk/research/project_data/More.asp?I=BD1443&M=KW...

you will probably have to copy and paste this into Explorer if it doesn't work by clicking onto it. The results should, hopefully, be very interesting, when they come out.

Francis

Dr F.W. Kirkham

Ecological Research & Consultancy

If you believe as I do that the 52(?) breeds of sheep and 30 (?) types of cattle, in the UK evolved due to presence or absence of trace elements, then that ,may be the place to start matching a breed to a site i.e. analyse the minerals on its home range then analyse the conservation site's minerals and so pick your breed to suit. If I had woken up to this idea years ago, I would have kept Lleyn sheep as there is an excess of manganese in the Lleyn peninsular, and that is a problem here as it locks up all the "vitamins" (vital

minerals) triggering swayback, low fertility, maybe prolapse, loose wool, foot rot and just possibly getting cast, and maybe and everything else they discovered to die from.

Does anyone else think that cattle are kept in too long in the spring and should be turned out much earlier and so get a small amount of new rich grass to start with and so the bugs change to cope and are available to use the rich spring flush more effectively. Also they are fed too well and should be turned out with bones showing as they then put on weight quickly with cheap grass and not expensive cake.

Round here there is an eye complaint known as "Hereford eye" seeming to indicate a breed weakness, unless anyone knows better ! Newmarket and Kentucky seem good for race horses and the latter has "Kentucky blue grass" which seems a vital ingredient in raising winners but why I have no proof.

Richard M

Just to check Francis if you mean that the hay meadows were being grazed after cutting. If so your data corresponds very nicely with mine, using Devon cross steers on moderately herb rich but previously improved (reseeded within the last 20 years) meadow aftermaths in N Lancs, grazing fields rotationally from August to October. All individuals achieved growth rates well in excess of 1kg/day, some as high as 1.5. They were all 26-27 months old and weighed 400kg or more to start with.

Your data for the Molinea is a bit confusing as a comparator because it appears to relate to stocking rate rather than individual performance. I remember a paper in Grass and Forage Science from around 2000 that gave the weight gain of 0.8+ kg/day for Blue Grey dry cows on Molinea in June. Typically I didn't make a note but it should be easy to track down.

I also remember some work at Iger Bronnyd Mawr showing that the difference between native and continental breeds (again Charolais x) diminished as the animals got older. My take on this would be simply that the continental gut takes longer to mature. Which could be an invitation for a pithy reposte.

best wishes

Bill

Sadly Paul I can't say as I went straight off to work on the Mendips and have never been back since. But it was clear by the end of just that one grazing season that the sward had been opened up quite radically. Maybe Paul Hackman is right about limestone communities being less susceptible to domination by Bp compared with chalk. Certainly there was never any express intention of exterminating the Bp at Swift's Hill.

Bill Grayson

Bill

I was referring to aftermath grazing (August-October) in the Somerset hay meadows, and I expect that there are advantages of clean aftermath growth compared to pasture grazed all season. However, IGER achieved growth rates of around 0.9 - 1.0 kg LW per day on MG5 type pastures grazed all season in another part of Somerset.

I was referring to a daily live weight gain of 0.5 kg / day on the molinia-rush pasture in the south west and Wales. These were averaged over about a dozen different sites I think, using a variety of cattle. I'll see if I can track down the Grass and Forage Science paper you referred to.

Francis

Dr F.W. Kirkham

Ecological Research & Consultancy

Bill

Further to my last email, the only Grass and Forage Science paper I can find between 1998 and 2002 that might be the one you were referring to related to MLURI work using Blue Grey suckler cows and calves on Nardus-dominated (i.e. not Molinia-dominated) hill pasture. The calves gained 0.60 or 0.86 kg /day, depending on which of two sward heights they were grazing to. This was in G and F Sci, vol 53, p260-269. Google didn't turn up anything else likely either.

Francis

Dr F.W. Kirkham

Ecological Research & Consultancy

too looked for the paper Bill referred to. There was one in 1997 (perhaps time flies, Bill): Common, T.G., Grant, S.A., Armstrong, R.H. and Torvell, L. 1997. The effects of Molinia utilization on diet selection and herbage intake by cattle grazing Molinia grassland. Grass & Forage Science, 52 207-218.

Alternatively there is Todd, P.A., Phillips, J.D.P., Putwain, P.D. and Marrs, R.H. 2000. Control of Molinia caerulea on moorland. Grass & Forage Science, 55 181-191.

I've only seen abstracts of these - although the latter is nearer the date Bill suggested the former seems more likely to report weight gains by cattle.

Richard

Dr. R. W. Small,

Programme Leader, Wildlife Conservation,

School of Biological and Earth Sciences,

It looks as if the first paper Richard refers to was the one Bill was thinking about. This was also carried out by MLURI, on Molinia-dominated upland pasture, using mature barren suckler cows - a mixture of Blue-Greys and Hereford x Friesian crosses.

All the cows had grazed similar pastures for at least one season beforehand. The average live weight gain of the animals varied from year to year over six years, from 0.52 - 0.97 kg per cow per day averaged over the whole grazing period when utilization of Molinia leaf growth was 33%, and from 0.47 - 0.67 kg/cow/day at 66% Molinia utilization. The authors compared their results with work from the Netherlands where live weight gain averaged 0.56 kg /head/day on Molinia dominated pasture utilized at 30%. However, the MLURI authors pointed out that cattle grazed from 1 May to 10 October in the Dutch study (160 days), compared to less than 50 days on average in their own study (mainly late June to late July-mid August), and that weight gain will have declined into the autumn in the Dutch work. Against this, the MLURI experiment was carried out in hill pasture at an altitude of 255-280 m, where the growth season would be shorter than in the Dutch study. One further point of interest, Molinia cover stabilized at 50-60% (from an initial 74%) after 3-4 years of grazing at 33% Molinia utilization, but declined continually at 66% utilization, suggesting that the latter level of utilization would be appropriate for management aimed at reducing Molinia.

The message would seem to be that if you use mature animals that are used to the pasture and you aren't trying to hammer the Molinia, you can get animal growth rates comparable with normal pastures, in the summer at least, although growth rates might tail off rather badly if you graze into the autumn. This ties in with IGER work showing that, even under grazing, the energy value of Molinia tails off substantially after about the end of June (speaking from memory).

Francis

Dr F.W. Kirkham

Ecological Research & Consultancy

The notes about herb-rich grass and its benefit to stock reminds me of agricultural college back in 1960!

The principal at Seale Hayne was Ian Moore who some of you may have heard of. He was a well-known grassland expert in those days.

He was telling us about the value of old grassland compared with the modern leys and we were a bit sceptical, to put it mildly. In those days it somehow seemed much better to produce huge amounts of grass with lots of fertiliser and there was a lot of joking about how much you could produce from the old grassland.

A pity we didn't take it more seriously

Paul

Paul

Your comment rings bells with me, too. I spent the first part of my research career in the 1970's trying to increase the ryegrass content of permanent pastures using herbicides that were selective between grass species. This was based upon the assumption that we would thereby increase the productivity of the swards. The upshot was that you could increase the perennial ryegrass content of creeping bent-red fescue-Yorkshire fog dominated pastures from less than 10% to about 70% but with no effect on productivity, either in grass yield or cattle production. You can do the same thing by applying 200-400 kg/ha / year of fertilizer nitrogen, and the production response differs little whether you start from an old permanent sward or from perennial ryegrass.

Perennial ryegrass on its own is actually less productive than several 'native' grasses individually (Yorkshire Fog, Creeping bent etc) unless you apply substantial amounts of fertilizer, and recent studies show that species-rich grasslands are more productive than species-poor ones growing under comparable conditions. As we have said in earlier correspondence, individual animal growth rates are often superior on herb-rich swards, although, as we have also discussed, one has to be careful when generalizing!

Francis

Dr F.W. Kirkham

Ecological Research & Consultancy

More half remembered references for you, Francis. John Frame published a review article back in the early 90s (again I think it was in (G&FS) showing that in unfertilized situations many wild species of grass outperformed *Lolium* in terms of palatability and other nutritional characteristics. Which makes you wonder just how it was picked as the one sp to concentrate all our breeding effort on.

I also like to refer to the very early work (1940s) that showed how the best thing you can do to improve productivity of your cattle is to give them a very diverse diet. And so what did we do but the exact opposite.

Does any one remember how about 18 months ago there was a sudden scare when someone noticed that the mineral contents for modern foodstuffs was markedly lower than it had been in earlier decades. It got a good airing on R4 but was very quickly dismissed as an understandable discrepancy arising from the newer methods of assaying nutrients. I couldn't help feeling that it was quashed far too easily and quickly, especially as it is well known that surplus amounts of NPK disrupt the plant's ability to take up minor minerals and trace elements. Add in the loss of herbs that are deeper rooted and can access minerals at deeper levels in the soil and I feel it must be an issue worth keeping in the viewfinder.

best wishes

An interesting point on the number of sheep breeds we have in this country:

I recently attended a seminar run by the National Sheep Association (very good, I might add) that included a presentation on how the UK sheep industry could tackle the

problem of performance in UK flocks falling so far behind New Zealand (I would stress here that this was targeted very heavily on flock producing lambs for the supermarket trade)

One key point that came out of this presentation is the lack of consistency in the UK product due to the diversity of breeds (compared with NZ where only a handful of breeds exist)

One wonders if 'conservation' grazing schemes are ultimately going to become essential also to the conservation of some of our native breeds.

Totally off the subject of Brachypodium control! Apologies

Cathy

Cathy Wainwright

Grazing Manager
