

Rural Alternatives Project: *Cultural Skills & Community Woodlands*



Case study no. 4: Bracken biofuel and fertiliser in Culag woods



Bracken Information Day

in crofting communities such as Assynt. Traditionally it was used for thatching buildings, to produce a yellow dye, for livestock bedding, in compost, as mulch and for fuel. Dr Donnelly suggested that the use of bracken in compost, as mulch and for potash could be useful in organic agriculture today and that bracken as a biofuel was relevant in the current climate of high fuel costs and global warming.

At the introductory workshop for the non-timber forest products-focused Rural Alternatives Project (RAP) in Culag Woods, one of the species the community were interested in finding out more about was bracken. Bracken is often thought of as an invasive, carcinogenic and toxic weed that carries ticks and reduces the rate of natural regeneration in woodlands, but does it have any good points or uses? To answer this, an expert on bracken, Dr Eric Donnelly, was asked to come and lead an Information Day on the uses of bracken in March 2007. He revealed that in the past bracken had been a useful resource

What the Culag group learned about bracken:

Bracken and nature conservation



Pearl bordered fritillary butterfly © Michal Koupy

Bracken is an important and natural part of our landscape. Originally a woodland plant, with the changes in land management practice and loss of woodland cover it has spread, and domination of an area by bracken is now a recognised problem. It can reproduce in two ways, by the rhizomes (roots) spreading and by spores. Interestingly, in Assynt over the past few years, it hasn't produced spores. In woodland clearings, small patches on hillsides and at woodland edges it has a nature conservation value, as habitat mosaics for many forms of wildlife including invertebrates, small mammals, some plant species and birds; and patchy stands can support species of threatened fritillary butterflies.

Harvesting bracken



Harvesting bracken © Dr E. Donnelly

Bracken can be harvested by traditional farm machinery or by hand. Harvesting at different times of the year has varying levels of control or sustainability of harvest. Harvesting bracken in summer is a useful control method as it reduces the vigour of the bracken and after a few years can remove it almost completely. This is mainly due to the removal of carbohydrates weakening the underground rhizomes. Harvesting in the spring or late autumn can reduce the bracken, but at a slower rate. It is also possible to harvest it as a long-term resource by cutting areas on rotation.

Wearing gloves and a facemask when cutting it is highly recommended to avoid exposure to the carcinogenic chemical (ptaquiloside) which bracken contains. It was originally believed this carcinogen was only contained in the spores, but it is now thought to be present in the whole plant.

Uses for bracken in organic gardening



Bracken composting © Dr E. Donnelly

As the carcinogen contained in bracken is destroyed during the composting process, bracken compost is quite safe, even on vegetables. It is recommended to allow one year before use to allow the breakdown of the carcinogens. Fronds cut in early summer will compost easily on their own; fronds cut in the autumn are drier and will require other material such as animal or poultry manure to be added. For best results, the fronds need to be chopped. Composted bracken has relatively high concentrations of potassium. Its greatest potential is as a sustainable alternative to

peat in both domestic and horticultural markets. There have been several costed trials, including one by the National Trust and another by the Shropshire Bracken Composting Initiative. Bracken is also used as a mulch to cover winter-tender plants, to reduce moisture loss from the soil and to suppress the growth of weeds. The ash from burning bracken cut late in the year can be used as a fertilizer, due to high levels of potassium and a high pH. It is especially suited to use on potatoes and tomatoes. Ash from burning dead spring litter does not contain much potassium, but it is reputed to be a very effective slug deterrent due to its light, sticky nature and liming qualities.

Bracken as a biofuel



Burning bracken © Dr E. Donnelly

Bracken fronds are a potentially useful biofuel. A hectare can yield up to 16 tonnes per annum; it doesn't need to be planted, fertilized or sprayed with chemicals and it doesn't need to be transported for hundreds of miles. It is quick burning with a higher calorific value than wood (typically 19-21 giga joules per tonne). Once dried it can be baled and burned in a bale burner, made into small pellets for automated pellet burners, shredded for burning in woodchip burners or made into large briquettes for open fires or wood-burning stoves. It can be mixed with other materials for burning, such as waste paper. Bracken fronds for burning should be harvested from August to

October, as during this period the fronds will have a high yield, lower ash content and yields can be maintained for years. Bracken litter should be harvested from March to April; litter has low ash concentrations and frond yields are not effected long term.

The future

Because of the amount of local interest in bracken as a biofuel, a feasibility study has been proposed. The aims of the study are to investigate the suitability of bracken as a source of biofuel specifically for the Lochinver area. The study will assess whether bracken could be used for the production of economically viable biofuel; reduction of heating cost of the area; reduction of carbon outputs from heating and fuel transportation in the area; provision of local employment; provision of income for landowners from land with few alternative uses; and reduction of reliance on imported fossil fuels. A summary document has been written to be used as basis for funding applications for the feasibility study.

A local community composting project is also being worked on; looking at using bracken will be part of this.

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For further information about the Rural Alternatives Project, visit:
www.reforestingscotland.org/projects/rural_alternatives.php

For general information about non-timber forest products, visit: www.forestharvest.org.uk

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