Since prehistory, people have fed trees to their animals. This ancient stone enclosure near Braemar, Aberdeenshire was presumably used to keep animals in. The only trees are two ancient sallows, which appear to be pollards, or at least show signs of having been cut at times in the past. The author knows of two other examples of old enclosures with ancient sallows. Could it be that the animal herders knew of the medicinal properties of the sallows and deliberately maintained them in such locations? *Ted Green*

Tree hay: the forgotten food

Ted Green argues for the revival of an ancient agricultural practice that has the potential to contribute to both biodiversity and the health of domestic livestock.

It is our understanding that humans were originally wandering hunter gatherers. So, sometime before their transition to becoming settled farmers with domesticated livestock, it is reasonable to assume that they developed the skills of herding wild animals; the beginnings of transhumance. As they wandered with their animals and watched their behaviour they would have noticed how the animals browsed both trees and shrubs. This was particularly so in warm regions such as the Mediterranean, when in the summer months other vegetation was 'burned off' by the sun and lack of water. In northern regions, however, they would have noticed the browse height of trees, and how animals rushed to feed on the green foliage from fallen trees or limbs, and in winter on the bark, buds and twigs.

The chances are that it was a small step from this observation to the herders intervening and deliberately breaking and tearing twigs and small branches for their animals. It was then perhaps not long before it was also noticed that if any green leaves that remained were allowed to dry they could be fed to animals in the winter months.

➔ An oak pollard carbon dated to 2,400 BC found during gravel extraction work alongside the river Trent in Nottinghamshire. Was it cut to provide fodder for animals? *Ted Green*

Pollarding and the original 'hay'

It is difficult to imagine how vegetation in a natural herb-rich pasture could have been easily harvested before the development of some form of cutting tool. So, perhaps the meadow hay with which we are all familiar was preceded, perhaps by millennia, by 'tree hay', fodder that could be collected from trees without any tools. I use the term 'tree hay' simply to draw attention to the similarities with the more familiar 'meadow hay' and to try and capture the imagination and curiosity of people who may be inspired to investigate its potential further.

Eventually, of course, tools would have been used to cut trees, and it seems likely that regular cutting for tree hay was the origin of pollarding. Only recently, evidence for prehistoric pollarding came to light during gravel extraction alongside the river Trent in Nottinghamshire. An oak pollard was found, and has been carbon dated to 2,400 BC. The pollard was well over the height at which beavers could work, so clearly they were not responsible. The growth rings were so incredibly small that it appears that the tree might have been cut annually, so reducing its growth to very small twigs.

It appears that across the temperate regions of Europe the majority of tree and shrub species have been used for tree hay through to historical times. However, if available, ash and elm (before its demise) appear to have been the preferred tree species, while holly and ivy were generally cut in severe winters or after a poor growing season for meadow hay. Indeed, in the early days of agriculture, as the use of meadow hay became more widespread, tree hay probably continued to be important as an insurance against poor growing seasons in which meadow-hay making was not possible.

Tree hay in modern Europe

Today, the cutting of tree hay in Europe is generally confined to the poorer and less inhabited areas such as mountainous regions. It is, however, more widespread in Mediterranean countries where subsistence farming and attended herding is still carried on.

While the methods of cutting and drying tree hay appear to be very varied (sometimes even down to an individual farmer) across the regions of Europe, the basic principles remain the same. Generally speaking, tree hay is produced by the cutting or breaking of limbs and twigs of deciduous trees and shrubs that are in full leaf. Branches vary in length from 60cm to 2m.

The foliage is then dried, stored, and fed to the animals in the winter. One method of drying is to stack and pack the cut braches into very tight bundles that are tied with twisted ropes of willow or hazel twigs. These are then stored green for drying, either under cover or hung above ground outside.

Minerals and medicinal value

It is thought that, as with meadow hay, the cutting of tree hay occurs at the optimum time for the storage of minerals and nutrients in the leaves and twigs, which then will remain present with drying. The dried leaves may also have some medicinal value. In the light of our increasing knowledge of plant communities and their interactions with associated essential micro-organisms, it does not seem unreasonable to suggest that trees may have many different mychorrhizal partnerships to those of herb-rich meadows. In turn, these complex relationships could be supplying the trees and shrubs with a very different range of nutrients and minerals, which are then stored in the dried leaves. Together with herb-rich meadows, trees are known to have natural beneficial medicinal properties useful to animals. Sadly, in modern animal husbandry such traditional medicinal knowledge has been lost.

Restoring the cutting of tree hay

The cutting of tree hay has recently been trialled at the Knepp Wildland Project in West Sussex (see *CLM* 13:2). Branches of different species of trees and shrubs were cut and bundled into faggots, while still green. These were then stored horizontally under shelter in a tight stack. Although some of these faggots went mouldy, many still had quite green leaves even after a season or two

↓ Eight-month-old faggots of tree hay, which had been cut in July. From left to right: wild service tree; sallow; wild cherry; ash (still with fairly green leaves); and field maple. *Ted Green*

↑ *Left* At Knepp, ash branches up to 2m in length were cut in early July. Small pegs up to 10cm were left on the tree, and the cut branches were hung from these to dry. Once dry, they should, if possible, be stored under cover. *Right* Early in the trial at Knepp, the cut branches were kept out of doors, and were not packed in a very tight bundle. Although the leaves and twigs dried perfectly when they were left to face the elements, a substantial amount of the leaves were lost. After drying they should have been stored in faggots and undercover in the dry, as they were later in the trial. *Ted Green*

of storage. In these trials, the tree hay was fed to the project's free-ranging longhorn cattle, which otherwise are not fed any supplementary hay or feed. They seemed happy to eat a range of species, although wild cherry appeared to be the least attractive. The cattle were regularly attracted from some distance to the area where the faggots of tree hay were being loaded on to a vehicle, which they would gather around, waiting to be fed. When the faggots were opened and scattered close to the wild Exmoor pony herd the response was exactly the same. Presumably the smell of the hay plays a major part in attracting the curiosity of both the cattle and the ponies.

Creating new pollards

We are all now familiar with the biodiversity value of veteran and ancient trees, and the importance of their decaying wood to communities of fungi, insects and other micro–organisms. Many of these trees began life as pollards, regularly cut for many wood products including tree hay. The cutting of tree hay today provides an ideal opportunity to establish new pollards that could become the

➔ Longhorn cattle at Knepp were regularly attracted from some distance to the area where the faggots of tree hay were being loaded on to a vehicle. *Ted Green*

veteran trees of the future. So, at Knepp much of the tree hay was cut from young trees, primarily ash. In addition, some new hedges have been planted with the future production tree hay in mind, and, for example, have not included thorn species. Such hedges will be managed by a combination of coppicing and pollarding.

The ideal time to start pollarding is once the tree is above the browse height (2.3–3.5m). Trees can be cut from when the main stem is about the thickness of a thumb, up until about 19cm in diameter. At this size the trunk is still all sapwood, and so when cut the exposed tissue will usually callus over completely, so making a fist-shaped bolling. This is incredibly strong, and any subsequent growth will be very secure and not liable to break off. In contrast, when newly-cut main stems do not callous over and form a bolling in this way, any new growth will only have support from the vertical face of the trunk, and therefore become very vulnerable to breaking away.

← A new pollard ready to be cut for the second time, with very vigorous growth and a good number of limbs. *Ted Green*

↑ 'Green islands' can be found on the leaves of many species of tree when they senesce in the autumn, and are caused when minerals and nutrients are withheld by parasitic micro-organisms that are still active in the leaf tissue. This cow is actively seeking out and eating fallen leaves that retain a green island, but not touching dead leaves. Presumably instinct and smell are very important. *Ted Green*

The two preferred species for tree hay, ash and elm are now significantly affected by disease. The regrowth of ash on trees pollarded for tree hay can be more susceptible to Chalara dieback. But, in contrast, the regular re-cutting of elm can keep the trees in a young phase of growth that is not vulnerable to attack by elm bark beetle and subsequent infection by Dutch elm disease.

A future for tree hay?

To some, the cutting and pollarding of trees to produce products such as tree hay will appear to be a labour-intensive, high-cost, and unproductive operation. However, for others it will be regarded as the continuation of an age-old part of our cultural and landscape heritage. The natural medicinal properties of tree hay will appeal to many, given the high monetary and environmental cost of manufactured pharmaceutical products. And, if we include the benefits of the minerals, nutrients and trace elements that such fodder contains, it could become appealing, especially to the owners of horses or rare breeds, and others at the 'high end' of the animal husbandry sector. Add in the benefits to biodiversity and the low environmental impact, and the revived use of tree hay becomes a very attractive option.

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Weblinks

Ted Green talks about tree hay on the Agricology website
www.agricology.co.uk/tree-hay-forgotten-fodder

Knepp Wildland Project
Follow links from www.knepp.co.uk

↑ Trees can be cut for tree hay once the main stem is the thickness of a thumb. *Ted Green*