

Comfrey – participatory research and fertility building

This article draws on work to evaluate the HDRA/Garden Organic Members' Experiment Programme which has now been running for over 60 years. More information is available in an e-book written by Francis Rayns, Gareth Davies and Margi Lennartsson. <https://indd.adobe.com/view/7fca5eed-b3e8-4c92-be11-df955280a832>

Common comfrey (*Symphytum officinale*) is a common wild plant that was known to medieval herbalists. Throughout the 19th century, several nurserymen included a range of varieties in their catalogues as ornamentals and the value of comfrey as an agricultural fodder crop was described in a number of text books. It sparked the interest of Henry Doubleday (1813-1902), a Quaker businessman from Coggeshall in Essex who attempted to make a glue for stamps from comfrey as a result of reading about its mucilaginous content; he wrote to the Head Gardener at St Petersburg Palace in Russia for new stock and was sent some seedlings that appeared to be rare hybrids between *S. officinale* and *S. aspernum* that were variously named as *S. x uplandicum* or *S. peregrinum*. He planted these out and made measurements of the yield they achieved, publishing the findings in the *Gardeners' Chronicle*.

The development of comfrey as a crop of agricultural interest was thoroughly described by Lawrence Hills in his book *Russian Comfrey* (Hills, 1953) and updated in *Comfrey, Past Present and Future* (Hills 1976). It was because of widespread interest in growing and using comfrey that led him to establish the Henry Doubleday Research Association (HDRA) – named after the Victorian pioneer. HDRA was formally registered as a charity in 1958 but built on the 'Comfrey Races' that had been run since 1954 in collaboration with Newman Turner, editor of *The Farmer*; participants from across the world measured their comfrey yields and competed for the greatest annual 'cut'. There was a very wide range of yields, depending on genotype, climate, soil and management; the winners were farmers in New Zealand and Kenya. Throughout the 1950s, Hills visited many growers of comfrey across the country: 'In this first season I saw more different comfrey plots than ever before, and it taught me that I was wrong when I attributed the difference in stem thickness and yield to rich or poor soil and neglected cutting. I had assumed that when Kew regarded comfrey as a species they were right, though I could see it was a variable one, and every one of the individual growers assumed that what they grew was the only cultivated comfrey' (Hills, 1976).



Laurence Hills in the comfrey patch at Bocking

The study of comfrey by HDRA was a very early example of participatory research. Lawrence Hills, its Director until 1985 and then its President, was at the centre of a communications network that stretched across the globe. A pattern of 'Members' Experiments' soon became established; these were designed each year by Hills (although they were often inspired by suggestions that had been sent in by members or correspondence with other researchers) and were then carried out by individual farmers or gardeners. The results were returned and the findings reported in the Association's quarterly newsletter. In the beginning there was strong emphasis on comfrey research but the same model was used to investigate plant varieties, pest disease, weed management, green manures and composts. Hills was also a

prolific author and speaker and included the latest findings in his books, newspaper articles and talks he gave around the UK and abroad. Gradually the Association expanded and other staff took on those responsibilities. HDRA was given a new working name of Garden Organic in 2005 but several Members' Experiments are still conducted each year.

Much of the early comfrey work was concerned with quantifying the differences between the various 'Bocking' strains that were characterised by Hills and named after the town of Bocking in Essex where HDRA was then based - he considered this was very important in order to optimise the use of the crop for particular purposes: 'We need any member who has cut and weighed this year to send in his figures giving the total number of plants, their individual weight and the dates of his cuts. The best number to weigh is 16, and yields are calculated by us to acre scale' (HDRA Newsletter 2, 1958). It was generally concluded that the greatest yields were obtained from Bocking 14 and Bocking 4. Although Bocking 4 was arguably more palatable as a food for animals or humans it was Bocking 14 that was most widely distributed by HDRA (at least in the UK) and, later, by other commercial organisations: 'The thin stems, high potash and high allantoin of this variety, which is rust resistant, make it perhaps the best British garden variety' (Hills, 1976). Sales of Bocking 4 by HDRA were stopped in 1967 because the stock had become infested with comfrey rust.

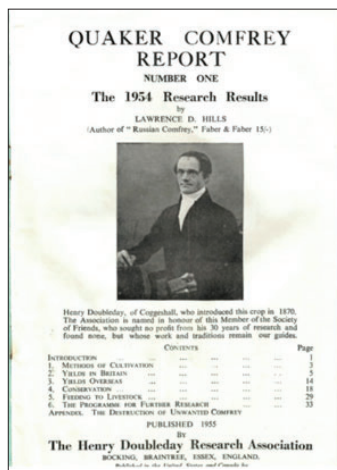
Photo: Garden Organic

The animal feed value of comfrey was the original motivation for its cultivation by 19th century farmers and the reason for its production by many of the early HDRA members. The leaves were known to be high in protein, minerals (especially potassium) and vitamin B12. Hills asked for contributions for the Newsletters and provided guidelines for the information that was needed: 'Please send in your stock feeding experiences - horses, cattle, pigs, sheep, goats or whatever you have fed it to. We need facts of quantities fed, egg and milk yields and live weight gains. Hundreds of people feed comfrey, their stock like it and it pays but we need details. We can make no claims without figures behind them' (HDRA Newsletter 2, 1958).

Many of the early HDRA members were enthusiastic eaters of comfrey in various forms and regularly contributed recipes for using it in a variety of ways - as a green vegetable (rather like spinach), in soups, as a flour made from the dried leaves or in alcohol. It was particularly popular as 'tea' - an infusion of the dried leaves. It was well established that comfrey was a good source of protein and minerals but a key finding was that it also contained high levels of Vitamin B12. Members were encouraged to investigate possible varietal taste differences: 'We need experimenters with space to plant two each of four kinds, willing to experiment on taste differences, ideally vegetarians or non-smokers' (HDRA Newsletter 2, 1958). There were repeated attempts made to 'conserve' comfrey so that it could be eaten throughout the year (by either humans or, indeed, animals - as dried leaves or as 'flour' made from leaves or roots). In the mid-1970s there was a hope that concentration of the proteins could be accomplished by microbial fermentation: 'We need the help of biochemists and bacteriologists to get this off the ground, because if we can, we have the possibility of a grant to take this further' (HDRA Newsletter 62, 1975).

The Comfrey Crisis

The possibility that comfrey could be poisonous was first mentioned in an HDRA Newsletter in 1963 but in 1978, in the light of new information, the HDRA committee decided that the organisation could no longer endorse the internal consumption of comfrey by animals or humans. This 'Comfrey Crisis' resulted from work on pyrrolizidine alkaloids and liver damage conducted by Commonwealth Scientific and Industrial Research Organisation (CSIRO) in Australia. A special 'Comfrey Restoration Fund' was started and an appeal made for all farmers who had fed comfrey to their animals, for at least a year, to have post mortems done



One of the first HDRA publications was a booklet entitled 'Quaker Comfrey' so that it would be acceptable for a North American audience as the word 'Russian' was politically sensitive at the time.

as they were slaughtered, to check for liver damage. It was also suggested that Members who had regularly drunk comfrey tea could have their blood tested and sent off for analysis. Debate on this issue continues, with some scientists considering that the risks may have been overplayed whilst others believe the concerns to be well-founded.

Many active HDRA participants were eager to develop the traditional use of comfrey in medicine - one of its traditional names was 'knitbone' and there was a widespread belief that it could help with ailments such as arthritis and asthma. Hills always emphasised the need for a fact based approach: 'We do not want to raise false hopes, we are searching for evidence that what has been tested by tradition and the experience of modern farmers works for human beings' (HDRA Newsletter 2, 1958). The newsletters contained many very detailed reports from members, describing the benefits that consuming comfrey or applying it externally had brought for a wide range of diseases and injuries suffered by themselves, their pets or their livestock. The collection of anecdotes such as these was obviously very subjective so attempts were made by the organisation to formalise the collection of such information with the aid of members who were doctors or otherwise medically qualified. A number of collaborations were attempted with universities or other organisations but medical research was really well beyond the resources of the organisation.

As both the membership of HDRA and the participants in experiments became dominated by gardeners rather than farmers, greater attention was paid to the potential of comfrey in maintaining soil fertility in horticultural production. Considerable effort was put into finding out if comfrey enhanced the quality of the crops to which it was applied. For example, potatoes grown on the Bocking Research Ground using comfrey, compost or chemical fertiliser were sent out to members for taste testing, although the results were inconclusive: 'You will see how many varying factors there are to take into consideration to prove what every organic gardener feels to be true - that he can tell the difference between shop bought potatoes and his own' (HDRA Newsletter 11, 1961).

It was found that comfrey foliage contains nitrogen and phosphorus in comparable concentrations to farm yard manure (FYM) whilst potassium levels could be much higher (Hills, 1980). These nutrients can be supplied to crops in a number of different



Photos: Garden Organic

ways and this knowledge was refined both through a series of formal Members' experiments organised by HDRA and as a result of individuals reporting the results of their own independent investigations:

Comfrey as a mulch

Comfrey leaves can be spread on the ground around a mulch between tomato plants or fruit bushes where they can suppress weeds and break down to release nutrients into the soil: 'A leading exponent of this system is Mr Jack Temple of 'Here's Health' who has grown tomatoes in the same greenhouse for twenty years, using comfrey and compost alone, without steam sterilising his soil' (Hills 1980).

Comfrey in garden compost

The high nitrogen content of comfrey means that it must be mixed with other materials to make good compost: 'Many vegan gardeners use comfrey as a compost activator because they will reject all animal matter, even household liquid activator' [urine] (Hills, 1980). One regular Member's experiment participant, Mr Rainbach, explained: 'I make my best compost ever by adding a cut of comfrey when preparing a heap' (HDRA Newsletter 15, 1963).

Comfrey in growing media

In response to the work of one member using a peat based tomato growing media that included comfrey, Hills wrote: 'I would particularly appeal to those who have the time space to try also two-thirds peat to one-third comfrey, mixing in both chopped and unchopped comfrey leaves. The questions are 1) which heap breaks down best? 2) Do they heat up? 3) Which heap finishes with the driest material by the spring? We would like reports and samples because we would also like to know just how far the tannins in the peat have conserved the nitrogen and how much of the other plant foods stay soaked in the peat' (HDRA Newsletter 1982).

Comfrey Liquid

An HDRA member, George Gibson of Guernsey, wanted a convenient source of potassium feed for his commercial tomato crop and so developed 'comfrey liquid' made by steeping comfrey leaves in water until they break down to give a liquid that is particularly high in potassium. It can also be done without the water with the leaves just packed in a drum or pipe and pressed down with a weight. Many members reported on their own refinements of methods for making comfrey liquid, for example: 'A number of you have been making versions of comfrey liquid manure for tomatoes, and we shall be doing it on the Trial Ground this year. Mr F Roscoe reports [on the ring culture method]... Mr C Bickerstaff reports [on using diluted liquid comfrey]' (HDRA Newsletter 37, 1969).

Pest control

Over the years there were several indications that applications of comfrey could repel pests. For example, Mrs Holman reported 'I take 8 good sized leaves and roughly chop them, place them in a pan and simmer for 20 minutes. Once cool I use it as a general protection against pests, particularly against peas and beans' (HDRA Newsletter 97, 1984). Hills considered that this could have

worked by stimulating growth through foliar feeding. Mrs Judy Morris also tried this against whitefly 'The comfrey spray was extremely effective and although I had to continue spraying with it I never had the swarms of whitefly again. It had no effect on caterpillars though' (HDRA Newsletter 100, 1985).

Comfrey today

The hope of Hills and other early HDRA members that comfrey would become a major crop for human and animal nutrition was not fulfilled, largely because of increasing concerns about its potential toxicity. However, comfrey has become very widely grown by organic gardeners as a source of soil fertility and the techniques developed by the HDRA membership as a result of their participation in the experimental programme, are now commonly described in authoritative gardening books, websites and other media channels. A 2018 survey conducted by Garden Organic confirmed that the plant is grown by gardeners across the whole of the UK; 62% believed or were certain that they were using the variety Bocking 14.

Lawrence Hills was always keen to engage more with commercial growers: 'We have 124 organic market gardeners, according to our computer printout, and we should like to hear from any of them who have used comfrey liquid manure for tomatoes, either at the roots or as a foliar feed' (HDRA Newsletter 82, 1980). Researchers at Coventry University are currently revisiting the use of comfrey by growers as part of the EU funded Organic-PLUS project (<https://organic-plus.net/>). This is concerned with finding alternatives to contentious inputs in organic agriculture, including the use of animal manures and animal by-products in horticulture; these are often derived from conventional farming and increasing numbers of vegan consumers find them unacceptable. Despite the early work done by HDRA there have been very few reports of the use of comfrey for crop nutrition in the scientific literature. More work is still needed to understand its nutrient dynamics and how it compares to other plant feeds in terms of efficacy and environmental impact. Novel ways of processing the comfrey will be investigated such as anaerobic digestion - this could bring other benefits such as providing energy for heating. We are also interested in the attitude of growers to producing such materials on-farm rather than buying them in - locally sourced fertility may be more sustainable but obviously entails extra work.

It can be concluded that comfrey is a plant that was a focus of much attention early in the history of the organic movement but perhaps remains rather underutilised, at least by commercial growers. It is to be hoped that current investigations may allow its potential to be fulfilled.

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