

Shetland sea power

Gaby Bartai travels north to meet a crofting couple whose search for an organic fertiliser led them into the seaweed business (Pictures: Gaby Bartai and Böd Ayre Products)

In Shetland you are never more than three miles from the sea, and it defines everything: the location, the isolation, the amazing ecology, the frequently terrible weather. The growing season is very short, and biomass for compost is consequently in short supply. So is manure: there are tens of thousands of sheep, but relatively few cows. Achieving a 'closed' organic system is difficult anywhere; on a windswept northerly island, your only option is to look to the sea.



Ten years ago, Margaret and Michael Blance took the decision to convert their croft to organic production, so they needed an affordable, accessible source of natural fertility for their land. They were also in need of a second income. Diversification is part and parcel of 21st-century crofting, which is only viable because it is subsidised, both by government and by the crofters themselves, who have to find other sources of income.

Margaret happened to be watching a farming programme which featured an Orkney crofter who was dragging seaweed up from the beach to spread on his land, and this set her thinking. Until the 1960s, before the ready availability of chemical fertilisers, this was the norm in Shetland, and a few crofters – my parents among them – do it still. Could seaweed, Margaret wondered, provide them with the fertiliser they needed for their own land, and also give them a product to sell?



Margaret and Michael Blance, the faces behind Böd Ayre Products

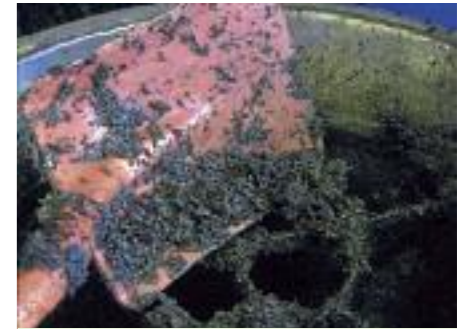
Their research took them first to the west coast of Ireland, where dried seaweed granules were already being produced for horticultural use, and then to the Royal Botanic Garden Edinburgh, for advice on ways of producing liquid seaweed extract. "One of them was boiling it, but we thought,



The seaweed is quality-checked on intake, to ensure that it is the correct species, freshly cut, and free of debris



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The seaweed is minced to produce the granules – and at the same time extract the liquid. For processing purposes, living seaweed is best – but unless you know how to cut it, you should only take loose weed from above the high tide line.



when you cook something you lose the goodness, so we thought we would do it the natural way. To begin with, Michael used an adapted hydraulic jack to squeeze the juices out of the seaweed. That worked to a degree, but it was far too messy, so then we put in the mincing machine, which was actually a salmon feed machine that we adapted. We discovered that the more we minced the seaweed to produce the granules, the more you churned it away, the more liquid came off as well."

What they developed, therefore, was a single process with two end products. You would assume that once the liquid had been extracted, there would be little nutritional value left in the weed itself, but that's not the case, says Margaret. "The goodness in the granules and the extract seems to split. Some nutrients will maybe move with the liquid, and some will stay with the granules, but overall it's all still there within both products. The extract is more a quick fix and the granules are more a slow release. We recommend that the granules are dug into the soil before you plant, and then as the plants are growing, you feed them every two to three weeks with the extract, so they're getting a continuous feed of natural nutrients right through, from planting right through to the end."

Once the seaweed has been minced, it is pressed for a couple of days to remove as much moisture as possible – so more extract is collected at this stage. The minced seaweed is then put through a custom-made dryer, powered by oil burners that provide intense heat. Some of the dried seaweed granules are then milled down into a meal, and they've developed a further by-product from the powder that is produced in the process. Nothing goes to waste.

Böd Ayre Products was established on a pilot scale in 2001, and launched as a limited company two years later. The scale of production, and their product range, have grown steadily, but the business is still run from the croft, and that's how it will stay, says Margaret. After all, the whole point of running a business from a remote corner of the Shetland Isles is to keep work and life in balance.



Oil burners are currently used to dry the seaweed; the plan is to move over to wind-powered underfloor heating



The seaweed is harvested sustainably from beaches around the isles

Seaweed harvesting

The seaweed that Bød Ayre use is eggwrack or knotted wrack *Ascophyllum nodosum*, which has distinctive ‘bubbles’ on its fronds. This is a commercial preference, however, not one that holds if you are collecting a bagful of seaweed from the beach for use as a mulch; other types are just as nutritious, says Margaret, but the processed output weight is lower.

The seaweed is harvested by hand, using a carefully developed technique which leaves the root and part of the plant intact, so that it regrows. Initially, Margaret and Michael cut the seaweed themselves from their local beaches; as they expanded, they started to advertise for casual workers, who harvest from beaches around the islands and sell the weed to them by weight. Inevitably, she says, their harvesters are people between jobs, or visitors financing an extended holiday on the islands. “They come, and then suddenly they go, and that’s just how it will always be. But if it comes that there’s nobody, and we’re needing, then we just go to the beach ourselves. It’s maybe a hard slog for a few days, but it’s worth it, because you ken that you’ve gotten going again.”

The standard advice to gardeners is only ever to take loose weed from above the high tide line, and never to cut living weed – but properly harvested, cutting seaweed is entirely sustainable. The advice Margaret and Michael got from Scottish Natural Heritage when they started out was that after cutting the seaweed on a beach, they should leave it fallow for four years. They still adhere to that, but they’ve observed that the seaweed actually regrows entirely within a year or so. In effect, what they are doing is like pruning, or cutting a lawn. They also ensure that their harvesters never strip a beach, so as to leave enough for wildlife in the short term. “We tend to just take and leave, and take and leave, so there’s plenty. Sometimes you come away fae a beach, and you would never ken anybody had been cutting. You have to be sensible; that way it’ll be sustainable for everything and everybody.”

Cure-all

Seaweed has long been seen as something of a universal panacea for ailing plants. The usual gardening-book advice on trace element deficiencies is not to worry too much about which particular element is at issue – just apply seaweed, which will supply whatever is missing, and top up everything else for good measure. “It’s not just the NPK, it’s everything else that’s within the seaweed that makes it so good. Because if a plant is lacking in one mineral, it sometimes doesn’t absorb that unless it has another mineral to help, and it’s the same with everything, whether it’s your land or your body or your animal. The seaweed has it all, at the natural levels.”

The claims made for seaweed are impressive – and the list certainly isn’t complete yet. It contains over 60 minerals and trace elements, plus numerous bio-stimulants, vitamins and amino acids. Feeding your plants with seaweed results in stronger root systems, improved growth, higher yields, and better-quality produce with, some say, a longer shelf life. Lawns fed with seaweed are greener, flowers are more colourful, and carrots are a brighter orange. Seaweed also seems to protect plants against scorching and frost damage.

Perhaps the most exciting development, however, is the mounting evidence that seaweed can improve plant health and prevent disease. It seems to increase resistance to clubroot and potato blight, and to deter blossom end rot in tomatoes. Pests seem to be discouraged, too: carrot fly will not attack rows of carrots dusted with seaweed powder, and blackfly and greenfly stay away from broad beans fed on seaweed.

A trial was carried out for the company by, as it happens, my father, Feri Bartai. A gardener of some 40 years’ standing, he moved to Shetland in 1997 and there encountered clubroot for the first time. The disease – known locally as ‘fingers and toes’ – is endemic in many Shetland gardens, because brassicas have been a staple part of a diet necessarily heavy on the hardier vegetables. Cauliflowers and kohlrabi were



Applying seaweed granules at planting time seems to protect brassicas against clubroot; These cabbages are grown in soil that has club root problems

worst affected, says my father. “When seeing a cauliflower the size of a lemon I knew what to expect when I saw the root stump.” His remedy in the early years was to grow his plants to a large size in pots and plant them out with a well-developed root system. This, he says, was reasonably successful, but labour-intensive.

In 2005 he experimented with Bød Ayre products and his initial results were, he says, “quite amazing”. He dug in seaweed granules prior to planting some of his cauliflowers and kohlrabis, and grew others without the seaweed as a control. “The difference was quite obvious.” The cauliflower crop was his best to date; some plants showed a hint of clubroot on the root, but the tops were unaffected. Although his results the following year were less clear-cut, he now applies seaweed granules at

planting time as a matter of course. “It definitely helps,” he says. Interestingly, the traditional Shetland practice was to dip the roots of kale plants in seawater before planting them out to protect them against clubroot, so perhaps the salt is a factor – but there’s clearly much more to it than that.

My father’s results are backed up by numerous testimonials from gardeners and farmers who have used Bød Ayre products and have stayed free of clubroot, or potato blight, or carrot fly – but what is needed now, says Margaret, is properly scientific research and controlled trials over an extended period, and she’s on the look-out for a PhD candidate in need of a thesis topic. Proof that it is possible to ‘inoculate’ plants or soil against diseases or pest attack could put seaweed at the forefront of 21st-century organic growing.



From left to right: Bød Ayre’s seaweed powder, meal and granules. Three very natural and sustainable products

Looking ahead

Bød Ayre’s products are certified organic by SOPA (the Scottish Organic Producers Association), but Margaret is keen to go further and develop truly organic production processes by factoring in hidden carbon costs. They are looking at the possibility of using biofuel, perhaps reusing waste oil from local school canteens or chip shops. They’ve just completed new drying rooms, so that the granules can be dried naturally using underfloor heating, and the next step is to install a wind turbine, which will harness Shetland’s formidable wind speeds to supply the necessary power.

Their next venture will be seaweed farming – a strange concept from a Western perspective, but entirely normal in countries like Japan where seaweed is part of the diet. The system they plan to use will be very similar to the way mussels are farmed, using ropes. These are currently suspended inside 1,000-litre tanks, through which water is continually pumped to create a current. “We’ve put different seaweed species growing on rocks into each tank, and we’ve put bare rope in the tanks, and we’re hoping that the seaweed species will release their spores, and attach to the ropes.” If all goes to plan, once the ropes are seeded, they will be moved into the open sea. Margaret and Michael are hoping to have a two-year trial farm in place from this summer.

Seaweed farming should have no ecological impact, since – unlike fish farming – it does not involve adding anything else to the water, and disturbances to the water will be minimal. Bød Ayre commission ecological surveys ahead of new developments, and they rejected an alternative system involving taut mesh nets, feeling that these would be a hazard for wildlife like otters. Dangling ropes should be easily negotiable, and ‘forests’ of seaweed will, in fact, create a habitat for marine wildlife, providing shelter from predators. “I feel that we can work alongside, rather than against. We’re wanting it all to be sustainable. Sustainable for us, but sustainable for the wildlife as well.”

It’s unlikely, says Margaret, that they’ll be able to grow all the seaweed they need, but she’s looking further ahead than that. “It’s a start, because you never know; in the future, there might be seaweed farms, dotted around the isles. People could grow seaweed that we could buy.”

Awareness of the importance of going back to natural products is growing all the time, she says, especially among the young gardeners who are driving the allotment renaissance, for whom growing organically is the whole point. Older gardeners, meanwhile, are delighted to find seaweed products available to buy, because they remember seaweed being used in traditional farming – but between the old and the young there is, she feels, a lost generation, who grew up with horticultural chemicals as the norm. “The young are certainly very aware, and the older ones know of the seaweed

being good. It’s the gap between that’s gone astray. All this nitrogen... it’s colossal what damage we’ve done to the environment, what tonnage of carbon dioxide it’s releasing, and what’s leaching back into the rivers and the sea.”

“All our projects seem to be happening at once, but I think it’s the right way to go. Sustainability is the word. We have to get away from using so much oil. It has to change.” In Shetland, with its empty beaches and big skies, it can feel like time is standing still – but at Bød Ayre they’re looking to the future.

Seaweed for your garden

Bød Ayre’s Sea-Feed Granular Plant Food is a slow-release soil conditioner and fertiliser for gardens and lawns; you can add it to the soil in spring and autumn, at the rate of 70g per square metre, dig it into the soil around permanent plantings, or mix the granules into the compost for containers and indoor plants. There’s also Sea-Feed Seaweed Meal Plant Food, milled to a finer grade than the granules, which can be used in the same ways and is also ideal for mixing with the grass seed for a new lawn.

For quicker results, there’s Sea-X Seaweed Liquid Extract, for use every two to three weeks during the growing season, or as a tonic for ailing plants, diluted in 40 to 80 parts water. Bød Ayre also produce Sea-Skeetie Ready-To-Use Extract in a 500ml spray bottle. The latest addition to the range is Sea-Poodir, seaweed powder which can be diluted in water to make a foliar spray. Alternatively, you can put it into a pepper pot and use it to dust your carrots and broad beans, to keep carrot fly and blackfly at bay.

The products are available in quantities to suit everyone from the window-sill gardener up to the farmer, and Bød Ayre also supply a range of seaweed feeds for horses, cattle, sheep, goats, pigs, poultry and pets. Their horticultural products are available from independent garden centres nationwide. You’ll find a list of stockists at www.seaweedproducts.co.uk, but if your local garden centre isn’t yet among them, you can also buy online.



The natural concentrated goodness of seaweed, packed and ready to go