

Seaweed – Facts and Experience

by

Ernest Booth

The Annual Reports of the Institute of Seaweed Research and the scientific literature contain a wealth of scientific evidence and practical experience on the manurial value of seaweed which deserves serious attention.

The superficial view is that seaweed contains some potash and little nitrogen or phosphate and, like all organic manures, it is often dismissed on this score. Yet despite its low phosphate content, seaweed has been shown to give a very substantial increase in the available phosphate in the soil. This effect is due to ketogluconic acid, a compound which is present in seaweed and is also excreted by common soil bacteria. In fact, current research suggests that this compound is probably the main factor controlling the supply of phosphate available to the plant.

The other components of seaweed are alginic acid, some unusual carbohydrates such as mannitol, fucoidan and laminaran, along with large quantities of trace elements. It also contains plant growth hormones and gibberellins, mere traces of which cause a dramatic increase in yield when sprayed on pasture. All these unusual compounds have been shown to affect soil fertility or to have other valuable properties such as the suppression of fungal disease (laminaran) or to chelate with metals to make them available to the plant (mannitol and fucoidan).

Alginic acid accounts for about 25% of seaweed and until recently it was believed to be found only in seaweed. Work at Rothamsted in the 1940's proved the soil-conditioning effect of alginic acid; subsequently it was shown that it also had the unusual effect of increasing seed germination. The beneficial effect of the acid on grass was known a decade ago and patents were taken out in Germany and the U.S.A. which claimed that seaweed preparations effectively established the growth of grass in the unfavourable conditions on the verges of motorways. These facts were well established but seemed inexplicable until 1965 when it was shown that alginic acid is a natural product in the soil where it is excreted by the common bacteria, *Azotobacter*. Soil fertility and the nitrifying bacteria had always been linked together. The alginic acid excreted by these bacteria adds to their importance as soil conditioners and aids seed germination; it also gives a sound explanation for some of the properties of seaweed.

Experience in many coastal areas e.g. Ayrshire and East Lothian, showed that seaweed was an unusually good manure for pasture and, in particular, it promotes early growth. This caused the Institute of Seaweed Research to approach the Sports Turf Research Institute at Bingley, where trials took place in the wet summer of 1954 and again in 1956. It was concluded that for top dressings, particularly on sandy soils, the addition of up to 10 per cent of seaweed in a prepared compost would improve drought resistance of the treated turf. The results were sufficiently promising to merit a large-scale trial which started at Muirfield in 1960 through the courtesy of the Honourable Company of Edinburgh Golfers. This trial was successful in every way and one of the more important results was the rapid regrowth on the approach to the greens where so much damage is caused by pitching and chipping.

Seaweed has been used in 'sports turf' mixtures for nearly 20 years and the liquid extracts have also been used throughout this period. As foliar spraying became established the liquid seaweed extracts have gradually replaced seaweed meal and they may be applied alone or mixed with other sprays. Prepared composts can also be materially improved by watering with a liquid seaweed extract.