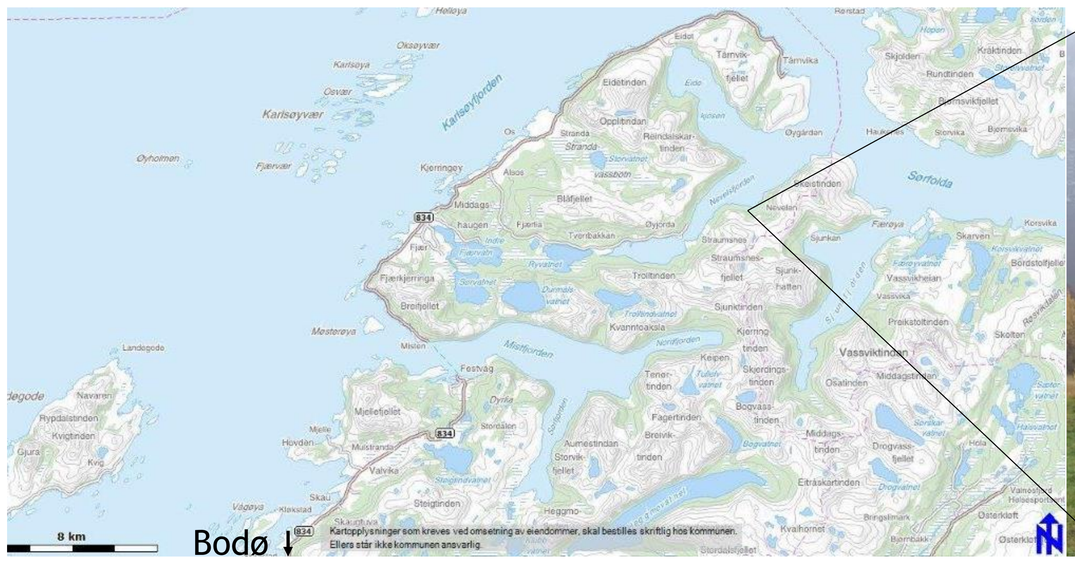
Seaweed — a resource for organic farming

Céline Rebours[1],
Susanne Friis Pedersen[1], Ingunn Øvsthus[2], Michael Y. Roleda[1]

Norwegian Institute for Agricultural and Environmental Research

Example of a Rasperries Farm in Kjerringøy, Nordland, Norway



Practices

Preparation of soil with *Lithothamnion*

Composting of Storm-cast Seaweed (*Laminaria*, *Ascophyllum*, *Fucus*)

100% biomass

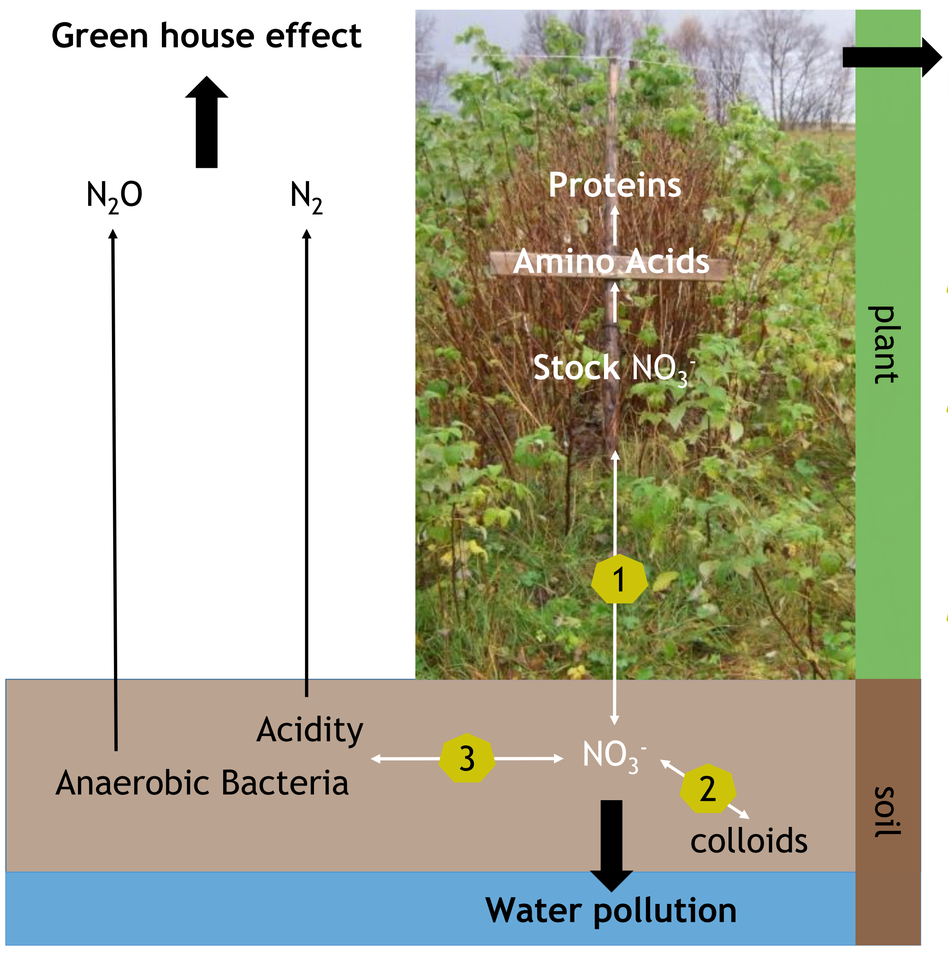
Left standing
(ground or open pit)

70% biomass

2.3% nitrogen
0.86% phosphorus
1.8% potassium

Seaweed compost used at 5-6 kg · m^{-2}

Regulatory effects of Seaweed-amended soil in plant production: Example on the Nitrogen dynamics



1 Phytohormones : regulation of NO_3^- use in plants.

2 Phycocolloids: increase formation of soil aggregates which improve nitrate and water retention in soil.

3 Calcium carbonate: neutralise acidic soil, reduce anaerobic bacteria activity and therefore reduce greenhouse gas emission.

Short review of seaweed hormones, polysaccharides and mineral, and their functions in plant physiology, health and cultivation, and soil quality and chemistry.

Substance	Function	Reference
Auxin	Cell elongation; growth	Stirk and van Staden 1997
Cytokinin	Promote cell division; chloroplast biogenesis	Stirk and van Staden 1997
Abscisic acid	Mediate adaptation to stress	Yang et al. 2012; Stirk et al. 2013
Betaine	Osmolyte against stress	Yang et al. 2012
Ethylene	Fruit ripening	Fornes et al. 1995
Gibberellin	Growth regulator	Stirk et al. 2013
Sulfated fucoidan	Enhance immune response; resistance against viral infection	Klarzynski et al. 2003
Alginic acid	Soil crumb stability; apparent water retention	Haslam and Hopkins 1996
Carrageenan	Resistance to viral and fungal infection; resistance to insect infestation	Sangha et al. 2011; Sangha et al. 2010a, 2010b
Agar	Soil stabilizer	McHugh 2003
Calcium carbonate	Neutralize acidic soil	McHugh 2003

References
Fornes, F., Sánchez-Perales, M., Guardiola, J.L. 1995. Acta Hort. (ISHS) 379:75-82. http://www.actahort.org/books/379/379_6.htm; Haslam, S.F.I.; Hopkins, D.W. 1996. Applied Soil Ecology 3(3):257-261; Klarzynski, O., Descamps, V., Plesse, B., Yvin, J.C., Kloareg, B., Fritig, B. 2003. Mol Plant Microbe Interact 16:115-122; McHugh, D.J. 2003. http://www.fao.org/docrep/006/y4765e/y4765e04.htm; Sangha, J,S., Ravichandran,S., Prithiviraj, K., Critchley, A.T., Prithiviraj, B. 2010a. Physiol Mol Plant P 75: 38-45; Sangha, J.S., Khan, W., Ji, X.H., Zhang, J.Z., Mills, A.A.S., Critchley, A.T., Prithiviraj, B. 2011. PlosOne 6: e26834; Sangha, J.S., Singh, R.P., Critchley, A.T., Prithiviraj, B. 2010b. Can J Plant Pathol 32:419-420; Stirk, W.A., Tarkowska, D., Turecova, V., Strnad, M., van Staden, J. 2013. J Appl Phycol DOI:10.1007/s10811-013-0062-z; Stirk, W.A., van Staden, J.,1997. J Appl Phycol 9:327–330; Yang, Z., Yu, J., Merewitz, E., Huang, B., 2012. Journal of the American Society for Horticultural Science 137(2): 96-106.

[1]Bioforsk, Norwegian Institute for Agricultural and Environmental Research, Frederik A. Dahls vei 20, 1432 Ås, Norway
[2]Department of Plant and Environmental Sciences, Norwegian University of Life Sciences, P.O. BOX 5003, 1432 Ås, Norway
celine.rebours@bioforsk.no