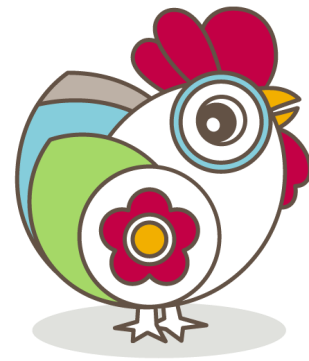


Perspectives of organic fertiliser products and industry in the Northern countries

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BIOLAN

Creating a greener world



45 years of Sustainability

Biolan Oy was founded 1974 to produce organic fertilizers from broiler manure.

Today:

- Processing over 100.000 m³ of organic side streams yearly
- total of 9 companies in 5 countries
- over 50 different products for organic and ecological farming
- over 20 different consumer products in the environmental category (composting, dry toilets, waste water treatment etc)
- several patents around environmental products and technology for green house climate management
- export to over 50 countries
- a family owned company focused on "offering ecological solutions to fight the harm done by people to environment"





Circular economy as core business

- Continuously replacing virgin raw materials with renewable raw materials and both agriculture and industry side streams
- Current raw materials: living Spaghnum moss, chicken and horse manure, wood fibers, bark, biochar, bone meal, feather meal, blood meal, peat, vinasse,...
- Liquid organic fertilizer = the NH_4 from the composting reactor washed into lactic acid
- Continuous research and co-operation in using new industry side streams

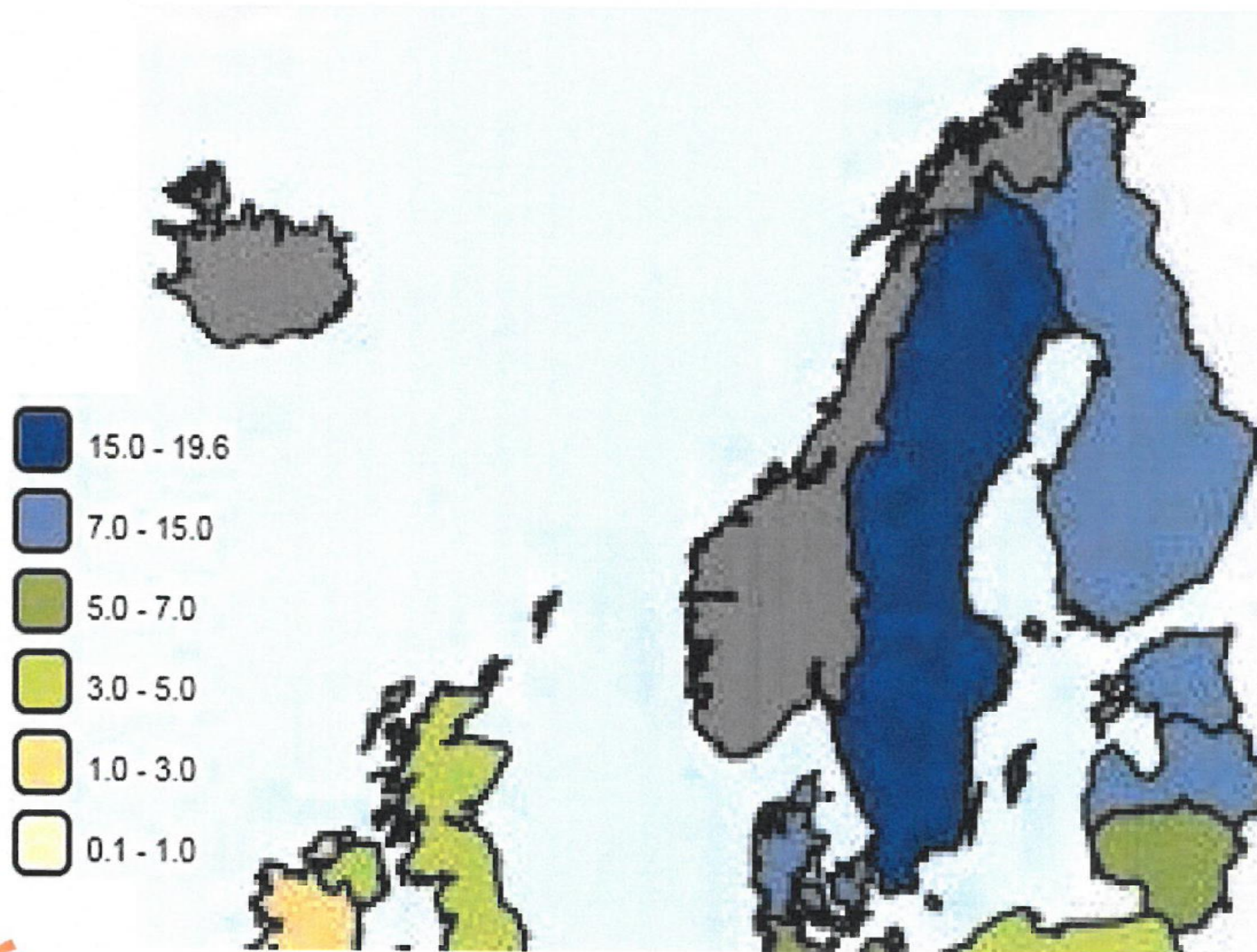




Organic and organo-mineral fertilisers

- **Products based on dried and granulated broiler manure**
 - Hobby gardeners
 - Professional horticulture
 - Organic farming
- **Recepies for plant categories**
 - Addition of raw materials accepted for organic farming
 - Developed together with organic farmers and food industry
- **Application**
 - Granulated fertilizer easy to apply with current farming equipment
- **New product line in field tests season 2019**
→ launch for season 2020

Northern European Countries and Field Area in Organic Production (Source: Eurostat 2014)



Population, prosperity and consumption of organic food, number of certified organic producers, area and % of certified organic farmland in the Nordic countries 2012

(Source: Löes, Anne-Kristin & al, 2015)

Country	Population, mill.	GDP/capita 1000 Euros 2012	Organic consumption, % of retail sales	Nr of certified organic producers	Certified organic farmland, thousand ha	Certified land, % of total
SWEDEN	9,3	35,6	3,9	5601	478	15,6
FINLAND	5,4	31,9	1,6	4322	198	8,7
DENMARK	5,5	32,7	7,6	2651	195	7,4
NORWAY	4,9	47,2	1,2	2590	55	5,1





Special features of the Nordic area

- **Short growing season**
 - Crop suitable for the climate
 - Effective means of farming; technology, equipment
- **Variety of climate and growing conditions within the area**
 - South vs north; coast vs inland
- **Cold winters, snow coverage of land, frost even in June, rainfall risks in critical time**
- **Legislation, monitoring, politics**



Drivers of the organic fertiliser industry

- Availability of raw materials
 - Manure, sludges, digestates
 - Legislation, funding
- Fertiliser or soil improver?
 - Nutrient value, value for soil
- Who's paying the price?
 - Is the material a side stream?
 - Is the material a problem for the producer?
 - Value of the end-product vs the price the user is willing to pay
 - Risks for farmers (contents of sludges and digestates)
- Location of materials vs potential users of materials
 - Concentration of industry and farms
 - Hot spots for manure production → need in other areas → logistics?



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