



Fertilisers from aquaculture and other marine waste

Anne-Kristin Løes

IFOAM/ESPP meeting on Recycled Nutrients in Organic Production

18th September 2023 14h-17h

Acceptability of secondary nutrients from seafood processing

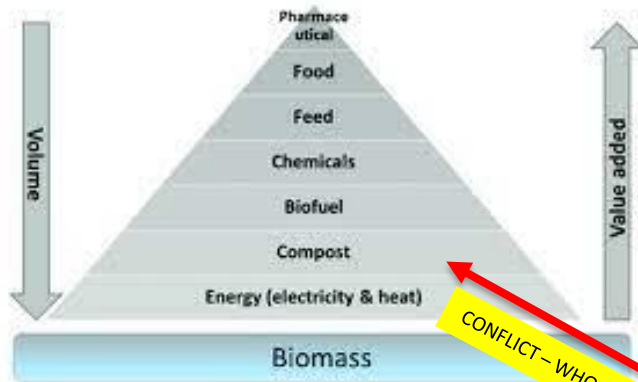


«Fat fish» (herring, mackerel..)
All residues applied for oil + meal
(feed in aquaculture)

Captured fish



«White fish» (cod, saithe..)
More bones; large heads
Significant volumes of residues
poorly utilised (formerly feed for
fur animals – what is the future of
that industry?)



CONFLICT – WHO PAYS MORE?



Bones with significant soft tissues

10-13 % tot-N (of DM)

9-11 % tot-P

12-13 % tot-Ca

0.4 % S

0.1% K, 0.1% Mg:

Needs blending for balanced plant nutrition



Ca. 4000 tonnes of P/year
in residues from white fish
are poorly utilised



Brown seaweed may supply K and Mg



Rockweed (*Ascophyllum nodosum*)
Ca. 4% K + 0.9% Mg (of DM)

CHEMICAL EXTRACTION



Rockweed sludge, ca. 25% DM
9% K, 1.5% Mg, 1.4 % tot-N (of DM)
Currently incinerated

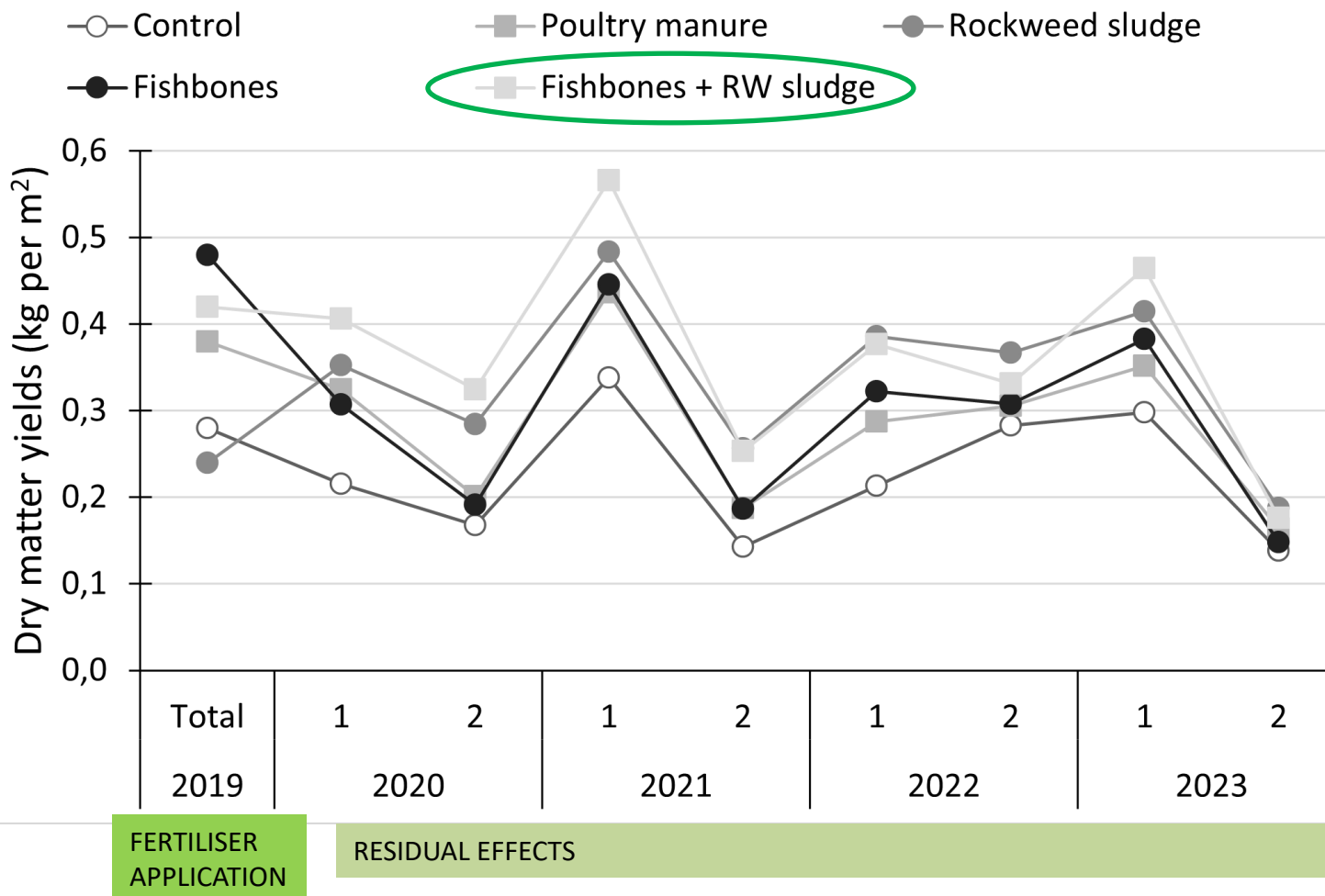
Fertiliser applied in 2019, residual effects studied 2020-2023



*Final harvest
August 11, 2023*

*After four seasons
with no fertiliser*

Best results achieved with 70% of tot-N from fish bones and 30% from rockweed sludge applied in 2019



160 kg tot-N/ha in various fertiliser materials applied in spring of 2019

Marine-derived materials support plant growth, but we still have a way to go

- Marine fertilisers will recycle nutrients lost from agriculture and food consumption
- For organic farming, we source for «wild» (captured, harvested) materials
- Concurrently, materials must be very cheap (competition!)
- Cultivated seaweed acceptable
- Fish from aquaculture not acceptable?
- What about processing chemicals?



- Contents of the session (10 min)
- Fertilisers from aquaculture and other marine waste: = total 10 minutes
Krister Hagström, EasyMining RagnSells - *secondary nutrients from aquaculture (fish farm sludge)*
Anne-Kristin Loes, Norsok *acceptability of secondary nutrients from seafood processing*
Question: *is aquaculture considered to be “factory farming origin” ?*

I would suggest that you both present briefly the fertiliser PRODUCTS = nutrient content, agronomic value, recycling value ...

And then we leave the question of “factory farming” open for discussion



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