

Usage of algae biowaste



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Problem Challenge Opportunity



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Why waste must be collected and utilized?

1. Environmental pollution caused by imbalanced use and misuse of chemical fertilizers and pesticides.
2. High levels of emissions from industries, agriculture, households
3. Increased eutrophication levels in the aquatic environment.



Step by step on development of the idea

- 2015. – study of the scientific literature of algae and seaweed waste. Initial analysis on chemical elements of waste
- 2016. October – 2017. March Green Technology incubator (Latvia): Experimenting on removal of toxic elements from biowaste
- 2017 – 2018. Baltic Tram & University of Latvia project: Testing on manipulation of extracts from seaweed bio waste
- 2018. – 2019.: Extracts' growth tests in University of agriculture of Latvia (LLU)



Toxic elements in algae waste**

Toxic elements	Green algae	Brown algae*	Latvia studies *(2016)	Limits for fertilizers
Cadmium (Cd)	7	1,1	1,7	3,0
Mercury (Hg)	1	-		2,0
Arsenic (As)	3	15	13,5	50
Nickel (Ni)	16	6,7	-	100
Copper (Cu)	6	-	13	600
Zinc (Zn)	32	28	89	1500
Plumb (Pb)	6 (-+2)	0,62	11	150

mg/Kg, dry mass,* *Fucus vesiculosus*; ** Engure municipality

Chemical composition of algae waste**

Makro/mikro elements	Green algae waste (2017)	Brown algae* waste (2018)	Other resources on Latvia algae waste* (2016)
Potassium (Ka)	11700	17200	11000
Calcium (Ca)	24700	24300	21500
Phosphorus (P)	2230	2500	1400
Magnesium (Mg)	5000	10400	9300
Iron (Fe)	3800	580	490
Sulfur (S)	25200	26000	-
Manganese (Mn)	590	1800	1600

mg/Kg, dry mass,* *Fucus vesiculosus*; ** Engure municipality



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Potential use of algae waste

- Bio-fertilizer, soil conditioning;
- Food supplement for farm animal welfare (f.ex. for cows against mastitis);
- SPA treatment, Pharmacy (spectrum of biological activities such as antimicrobial, antiviral, antifungal, anti-allergic, anticoagulant)
- “Sea Silk”
- Paper (contain cellulose ~ 7%).
- Thermal insulation



Thank you!



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