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Seaweed Fertilizers in Modern Agriculture

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Abstract

Seaweed is a multicellular marine algae, it's very important for the marine living renewable source, seaweeds wildly used for gelling and stabilizing agents for many food and pharmaceutical industries. Soil fertility it depends upon the fertilizer requirement of the plant or crop, now a day's lot of chemical fertilizers commercially available but the growth, yield and fertility of the soil are very much reduced/damaged. Recent studies proved that seaweed fertilizer very much better than other fertilizer. The seaweed fertilizers contained a lot of nutrients such as nitrogen, phosphorus, potash and plant growth hormones and trace element. This seaweed fertilizer is used to enhance the seed germination and plant growth/crop yield.

Keywords: Seaweed, Fertilizers, Plant Growth, Fertility

1. Introduction

Along with population rise, there should be a rise in the agro product as well. Though the fertilizer industries are fast growing to compete with the rise in food production, the rise in fertilizer product is not up to the mark (Jeswani,1999). According to the World Economic Outlook report, World fertilizer nutrients consumption is estimated to reach 186 900 000 tones in 2014, up by 2.0 percent over 2013. World demand for total fertilizer nutrients is estimated to grow at 1.8 percent and is forecast to reach 50.21 million tones by 2020.

As a drawback of chemical fertilizers is becoming more apparent, farmers are gradually turning towards organic fertilizers, with escalating demand, availability of organic fertilizers from one or two sources is not sufficient. To meet the increasing demand many viable options as possible have to be explored and one of such option is the use of seaweeds as fertilizer (Chhaya, 1997; Green, 2015). Seaweed is flowering plants which present in the marine environment, Seagrass beds are very important in the marine ecosystem (Govindasamy et al., 2013; Ruban, 2013). Seaweed extracts have been marketed for several years as a fertilizer additives and beneficial results from their use have been reported many claims have been made for seaweed extracts including better seed germination and deeper root development, increased frost resistance, increased nutrient uptake and changes in plant tissue composition, increased resistance to fungal diseases, reduced incidence of insect attack, higher yields, longer shelf -life of produce and improved animal health when livestock is grazed on treated crops or pasture (Blunden, 1972; Zodape, 2001; Govindasamy et al., 2011). It has been shown that the recital of seaweed manure is greater to the predictable organic manure viz., farmyard manure. Therefore seaweed extract used as a fertilizer and is being given to be a source of microelements including trace elements.

Extracts derived from marine algae have been used over the past decades on various crops to help growth and development. Interest in these seaweed concentrates on the

agricultural system is focused on their use as an economical source of naturally occurring plant growth controller. Much of the advantage from the application of seaweed extract has been accredited to the presence of the plant hormones, especially cytokinins. Various seaweed concentrates contain significant amount of cytokinin in totaling to other phytohormones (Bokil, 1974; Sharma et al., 2014).

2. Some of the Methods for the Preparation of Liquid Seaweed Fertilizer (LSF)

Seaweed extract is an organic manure contained amino acids, antibiotics, gibberellins auxins and other vitamins and trace elements in it. Some of this gist is decomposed by heat and hence it is necessary that they should be conserved if they are to benefit the crops. The method of extraction and the species used could be of great importance to the plant growth activity of the extract. Many seaweed constituents are known to undergo marked seasonal variations, which are being considered, in both commercial seaweed extract production and in the evaluation of inconsistent field trial results (Muller-Feuga et al., 2012; Satish et al., 2015). Many species have been reported to be used for the preparation of LSF such as Furcelaria fastigiata, Sargassum plagiophyllum, Ascophyllunt nodosum, Dttrvillea potatorum, Sargassum tvightiii (Myklested, 1964) Samgasstun plagiophyllum, Padina pavonica, Champia, Laminaria saccharina, Fucus serrants, Pterocladia, Ecklonia radiate (Bhosle et al.,1975).

Challen and Hemingway (1966) and Jayasinghe et al. (2016) have described the method wherein two samples of commercial seaweed meal, one derived from Aseoplivlhun nodosum and another derived from Furus vesiculosus were used to prepare extract according to the following method: The powder was mixed with distilled water and allowed to stand. The mixture was boiled, allowed to stand for some time, then passed through a fine sieve to remove the solids and the liquor obtained was centrifuged. The solids from the sieve and centrifuge were pressed and the liquor obtained was mixed with the main liquor. The combined liquors were then concentrated under reduced pressure

to yield a brown fluid. The percentage of total solids was determined and the extract diluted with sufficient water to contain the same percentage of total solids as the commercial seaweed extract. The extract of dry seaweed was further diluted when required.

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