International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
www.chemijournal.com
IJCS 2020; 8(5): 189-191

Received: 15-05-2020
Accepted: 05-07-2020

Rajeev Kumar
Department of Agronomy, Chandra Shekhar Azad University of Agriculture and Technology, Kanpur, Uttar Pradesh, India

Ram Pyare
Department of Agronomy, Chandra Shekhar Azad University of Agriculture and Technology, Kanpur, Uttar Pradesh, India

Uday Pratap Singh
Department of Agronomy, Chandra Shekhar Azad University of Agriculture and Technology, Kanpur, Uttar Pradesh, India

Yatindra Kumar
Department of Agronomy, Chandra Shekhar Azad University of Agriculture and Technology, Kanpur, Uttar Pradesh, India

Anjani Kumar Singh
Department of Agronomy, Chandra Shekhar Azad University of Agriculture and Technology, Kanpur, Uttar Pradesh, India

Corresponding Author:
Rajeev Kumar
Department of Agronomy, Chandra Shekhar Azad University of Agriculture and Technology, Kanpur, Uttar Pradesh, India

Performance of sea weeds granules (*Ascophyllumnodosum*) with recommended dose of fertilizer on growth and yield of Paddy crop in central plain zone

Rajeev Kumar, Ram Pyare, Uday Pratap singh, Yatindra Kumar and Anjani Kumar Singh

DOI: https://doi.org/10.22271/chemi.2020.v8.i5c.10296

Abstract
The experiment was conducted at the Student's Instructional Farm of Chandra Sekhar Azad University of Agriculture and Technology, Kanpur during *kharif* season of 2018 assess the application time of sea weeds granules (*Ascophyllumnodosum*) with recommended dose of fertilizer on growth and yield attributes and yields of Paddy crop. The experiment comprises of ten treatments *viz*. Control (RDF), RDF + Soli Gro Gr @ 10 kg/ha at FLP, RDF+SoliGro @ 10 kg/ha at 25 DAT, RDF+SoliGro @ 10 kg/ha at 45 DAT, RDF+SoliGro @ 10 kg/ha at 65 DAT, RDF+SoliGro @ 10 kg/ha at FLP & 25 DAT, RDF+SoliGro @ 10 kg/ha at FLP & 45 DAT, RDF +SoliGro @ 10 kg/ha at FLP &65 DAT, RDF+SoliGro @ 10 kg/ha at FLP, 25 & 45 DAT, RDF+SoliGro@ 10 kg/ha at FLP, 25, 45 & 65 DAT laid out in Randomized Block Design with three replications. Results revealed that the application of seaweed extracts (Soli Gro Gr @ 10 kg/ha) at final land preparation time and 25 days after transplanting of crop with recommended dose of fertilizers promoting growth attributes *viz*., plant height, functional leaves/plant and yield parameters *viz*., grain/panicle and effective tillers (m^2) and grain yields *viz*. were recorded highest in recommended dose of fertilizer and applied two time Soli Gro Gr @ 10 kg/ha at final land preparation time and 25 days after transplanting of crop compared to all rest treatments in present investigation.

Keywords: Seaweed extract, recommended dose of fertilizer

Introduction
(*Oryza sativa* L.) is a most important cereal crop, grown under aquatic condition and mostly under submergence or variable ponding condition. It is a most important staple food of about more than 60%of total world population. About 90% of the world rice is produced and consumed Rice in Asia (FAO 2014). Rice is cultivated worldwide over an area of about 163.20 million ha with an annual production of about 758.98 million tones. (503.80 million tones, milled basis) and productivity 4.60 tons per hectare in 2019. About 90%of all rice grown in the world is produced and consumed in the Asian region. It accounts 43%of total food grain production and 55%of cereal production in the country. It is a high caloric food, which contain 75%, starch 6-7% protein, 2-2.5% fat, 0.8% cellulose and 5-9 % ash. In India, rice is grown over an area of about 43.50 million ha which produces 111.01 million tones with an average productivity of 2590 kg ha. In U.P., it is grown in an area of about 5.86 million ha with production of 12.90 million tones and productivity of 2132 kg ha. (Anonymous, 2019) [2]. Rice is a nutritious cereal crop, mainly used for human consumption. It is the main source of energy and an important source of protein providing substantial amount of recommended nutrients. Seaweeds are the macroscopic marine algae. This is a substitute of chemical fertilizer and source of various chemicals required to agricultural crops. Seaweed are present in liquid form as liquid fertilizers and bio-stimulants in market, because they contain many growth regulators and various macro and micronutrients required for plant growth and development. They helps in growth promotion of beneficial soil microorganisms.

Materials and Methods

The experiment was conducted at student's Instructional Farm. Chandra Sekhar Azad University of Agriculture and Technology, Kanpur during *Kharif* season of 2018. The experimental field was situated in the central part of Uttar Pradesh. The experimental soil was sandy loam in texture and slightly alkaline in nature. The treatment was comprising of ten treatments was laid out in Randomized Block Design with three replications. The details of treatments as farmer practice (RDF), RDF + SoliGro Gr @ 10 kg/ha at FLP, RDF+Soli Gro @ 10 kg/ha at 25 DAT, RDF+SoliGro @ 10 kg/ha at 45 DAT, RDF+SoliGro @ 10 kg/ha at 65 DAT, RDF+Soli Gro @ 10 kg/ha at FLP & 25 DAT, RDF+SoliGro@ 10 kg/ha at FLP & 45 DAT, RDF +SoliGro @ 10 kg/ha at FLP &65 DAT, RDF+Soli Gro @ 10 kg/ha at FLP, 25 & 45 DAT, RDF+Soli Gro @ 10 kg/ha at FLP, 25, 45 & 65 DAT. Paddy cultivar variety NDR-359 was used in the experiment. Nursery raising was done on before 25 days transplanting of rice. Harvesting were done in all the plots with hand sickles by manual labours at maturity on dated 22 Nov., 2018.

Results and Discussion

Effect of SoliGro Granule on growth attributes of rice

The significantly highest plant height (93.93 cm) was observed under the application of RDF along with SoliGro Gr @ 10 kg ha^{-1} at final land preparation time and 25 days after transplanting. The tillers/hill was not significantly observed whereas, the maximum effective tiller/hill (9.67) was obtained under the treatment of recommended dose of fertilizer along with use of two time Soli Gro Gr @ 10 kg/ha at final land preparation time and 25 days after transplanting of rice crop in present in investigation, respectively. While, the functional leaves/plant significantly more was recorded under the treatment of recommended dose of fertilizer with applied SoliGro granule @ 10 kg/ha at 25 days after transplanting of crop (19.86) and same result Gr@10 kg/ha at field land preparation time, 25, 45 and 65 days after transplanting of rice (19.86). Seaweed new bioactive compounds are also produced like polysaccharides and organic acids. Similar results were represented by Kavitha *et al*., (2008) [7], Abbasi *et al*. (2009) [1] and Ghulam *et al*. (2011) [4], Jawahar *et al*. (2010) [6] and Sasikala *et al*. (2016) [9].

Effect of Soli Gro granule on yield attributes of rice

Application of seaweed granules (Soli Gro Gr) @ 10 kg/ha with recommended doses of fertilizers were not significantly improved panicle length. In case of grains/panicle and effective tillers/m^2 were significantly recorded under the recommended dose of fertilizer with application of two times Soli Gro Granule @10 kg/ha at final land preparation and 25 days after transplanting of crop. Whereas test weight were numerically higher under the treatment of recommended dose of fertilizer with two times SoliGro granule @ 10 kg/ha at final land preparation and 25 days after transplanting of rice compared to all remaining treatments, respectively. Seaweed extracts increased yield attributes due to containing of nutrients macro and micronutrients (Zn, K, N and P etc.) uptake efficiency increased positive effect on cell division and cell elongation. This result also similar to Thirumaran *et al*, (2006) [10].

Effect of Soli Gro granule on yields

The grain yield was significantly higher (54.84 q/ha) recorded under the application of Soli Gro Gr @ 10 kg/ha at final land preparation time and 25 days after transplanting of rice crop. Seaweed extracts are known to improve the source-sink relationship translocation of photo assimilates and there by photosynthetic ability of plants and thus play significant role in realization of high productivity levels and higher crop yields. Whereas, the maximum biological and straw yield recorded in treatment of RDF with four time application of Soli Gro Gr @ 10 kg/ha at final land preparation time, 25, 45 and 65 days after transplanting (147.67and 92.43q/ha, respectively).Seaweed extracts implies the presence of more than one group of plant growth promoting substances/hormones i.e. Zeatin, isopentenyl, benzyl amino purine, tolin, andauxin like compounds they directly increases biological yield especially cytokinins. Similar results have also been reported earlier by Aroubandi *et al*. (2017) [3] and Islam *et al*. (2014) [5].

Table 1: Effect of SoliGro Gr @ 10 kg/ha along with RDF on growth and yield attributes of rice during *kharif* season of 2018

Treatment	Plant height (cm)	Effective tillers/hill	Functional leaves/plant	Panicle length	Grain/panicle	Effective tillers/m^2	Test weight (g)
Control/Farmer practice (RDF)	87.98	7.41	18.08	22.31	126.46	378.70	24.07
RDF + SoliGro Gr @ 10 kg ha^{-1} at FLP time	91.09	8.27	18.08	23.00	134.56	401.35	23.79
RDF + SoliGro Gr @ 10 kg ha^{-1} at 25 DAT	93.49	8.99	19.76	23.97	140.70	433.05	24.80
RDF + SoliGro Gr @ 10 kg ha^{-1} at 45 DAT	90.89	8.22	18.41	22.86	133.60	392.05	23.75
RDF + SoliGro Gr @ 10 kg ha^{-1} at 65 DAT	89.89	8.10	18.29	22.74	131.70	382.85	23.67
RDF + SoliGro Gr @ 10 kg ha^{-1} at FLP time & 25 DAT	93.93	9.67	19.86	24.01	143.80	441.04	25.47
RDF + SoliGro Gr @ 10 kg ha^{-1} at FLP time & 45 DAT	92.53	8.78	19.18	23.90	136.00	428.60	24.45
RDF + SoliGro Gr @ 10 kg ha^{-1} at FLP time & 65 DAT	92.21	8.46	19.71	23.88	134.80	411.76	23.85
RDF + SoliGro Gr @ 10 kg ha^{-1} at FLP time, 25 & 45 DAT	93.08	8.85	18.97	23.91	137.80	430.89	24.85
RDF + SoliGro Gr @ 10 kg ha^{-1} at FLP time, 25, 45 & 65 DAT	73.70	8.90	19.86	23.93	143.13	432.69	24.95
SE (d) ±	0.883	1.002	0.409	0.723	0.438	1.558	0.755
CD at 5%	1.870	N.A	0.866	N.A	0.929	3.299	N.A

Table 2: Effect of Soli Gro Gr @ 10 kg/ha along with RDF on yields of rice during *Kharif* season of 2018.

Treatment	Biological yield (q/ha)	Grain yield (q/ha)	Straw yield (q/ha)
Control/Farmer practice (RDF)	122.77	44.09	78.27
RDF + SoliGro Gr @ 10 kg ha^{-1} at FLP time	135.25	49.85	85.79
RDF + SoliGro Gr @ 10 kg ha^{-1} at 25 DAT	144.39	53.57	90.62
RDF + SoliGro Gr @ 10 kg ha^{-1} at 45 DAT	135.09	49.06	84.83
RDF + SoliGro Gr @ 10 kg ha^{-1} at 65 DAT	130.97	47.88	82.76
RDF + SoliGro Gr @ 10 kg ha^{-1} at FLP time & 25 DAT	145.59	54.84	89.31
RDF + SoliGro Gr @ 10 kg ha^{-1} at FLP time & 45 DAT	141.19	51.97	88.80
RDF + SoliGro Gr @ 10 kg ha^{-1} at FLP time & 65 DAT	138.80	50.59	87.85
RDF + SoliGro Gr @ 10 kg ha^{-1} at FLP time, 25 & 45 DAT	146.50	54.67	91.92
RDF + SoliGro Gr @ 10 kg ha^{-1} at FLP time, 25, 45 & 65 DAT	147.67	54.69	92.43
SE (d) ±	0.483	0.718	0.447
CD at 5%	1.024	1.521	0.947

Reference

1. Abbasi MK, Mushtaq A, Tahir MM. Cumulative effects of white clover residues on the changes in soil properties, nutrient uptake, growth and yield of maize crop in the sub-humid hilly region of Azad Jammu and Kashmir, Pakistan. Afr J Biotechnol. 2009; 8:2184-94.
2. Anonymous, Govt. of India Ministry of Agriculture and farmers welfares, Agricultural Statistics at a Glance, 2018.
3. Aroubandi H. Impact of silicon in managing rice diseases, Yield and quality of rice. Scinzer J Agric. Biol. Sci. 2017; 3(1):22-36.
4. Ghulam A, Khan M Q, Khan MJ, Tahir M, Ishaque M, Hussain F. Nutrient uptake, growth and yield of wheat-(Triticum aestivum L.) as affected by manganese application. Pak J Bot. 2011; 43:607-16.
5. Islam MS, Paul SK, Sarkar MAR. Varietal performanceof modern transplant Aman rice subjected to level of nitrogen application. Journal of the Bangladesh Agricultural University. 2014; 12(1):55-60.
6. Jawahar S, Vijayakumar D, Raj Bommera, Neeru Jain, Jeevanandham T. Effect of silixol granules on growth and yield of rice. Int. J Curr. Res. Aca. Rev. 2010; 3(1):168-174.
7. Kavitha Ganesaraja V, Paulpandi VK. Effect of foliar application of seaweed extract on growth and yield of rice (oryza sativa L.) Agric. Sci. Digest. 2008; 28(2):127-129.
8. Khan MU, Qasim M, Khan IU. Effect of integrated nutrient management on crop yields in rice-wheat cropping system. Sarhad J Agric. 2007; 23(4):1020-1026.
9. Sasikala M, Indumathi E, Radhika S, Sasireka R. Effect of seaweed extract (Sargassum tenerrimum) on seed germination and growth of Tomato Plant (Solanumly copersicum). International Journal of Chem Tech Research vol. 2016; 9(9):285-293.
10. Thirumaran G, Pratap Karmakar, Anantharaman P. Effect of seaweed extracts used as fertilizer for Abelmoschus esculentus. Journal of Ecobiology. 2006; 19(4):373-376