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To

State Marketing Manager
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Subject: Submission of the results of the effect of Sagarika (seaweed liquid and granules) in potato and mungbean yield

Sir

I am hereby submitting the results of potato and moongbean yield after the application of Sagarika (seaweed liquid and granules). The details are as follows.

Effect of Sagarika seeweed extract on Potato yield

Effect of Sagarka seeweed extract (Granule and Liquid) on potato yield (q acre^{-1}) has been presented in Table 1. Sagarika granules @ 10 kg/acre + 100 % RDF significantly increased the tuber yield by 13.19 % (110.45 kg acre $^{-1}$) over control i.e. 100 % RDF + water (97.58 kg acre $^{-1}$). While, the Sagarika liquid @ 5ml/l + 100 % RDF increased the tuber yield by 7.29 % over the control, which was significantly lower than Sagarika granules application by 5.50 %. Application of 2.5 ml/l and 5 ml/l Sagarika liquid along with 100 % RDF were at par with each other i.e. 102.66 kg acre $^{-1}$ and 104.69 kg acre $^{-1}$, respectively. Sagarika liquid @ 2.5 ml/l + 100 RDF increased the yield by 5.21 % over the control. But it was 7.05 % lower than granule application. If we reduce the fertilizer dose by 25 % along with the Sagarika liquid application @ 2.5 and 5 ml/l, it reduced the tuber yield by 6.1 and 2.12 %, respectively over the control. While the Sagarika granule @ 10 kg/acre along with 75 % RDF still increased the yield by 5.22 % over control. This indicated that Sagarika granule is better than Sagarika liquid. As the Seaweed extract contains major and minor nutrients, amino acids, vitamins, cytokinins, auxin and abscisic acid like growth promoting substances and have been reported to stimulate the growth and yield of plants. Hartmans and van Es (1979) also reported that kinetin, a derivate of cytokinins, increased the branching of sprouts on potato. The vigorous haulm growth which is caused by cytokinins, however, does not decrease the tuber yield (Badizadegan et al. 1972). The Sagarika granules which has been

applied at the time of sowing may have stimulate the growth and development of plants in early stages along with the improvement of the soil environment. While, the Sagarika liquid, which was applied at 30th day of sowing, may not have any effect on the soil environment, hence very little and no benefit on yield. Similarly, the reduction in the fertilizer dose can not be recommended, as there is no enhancement in the tuber yield.

Table 1 Comparison of total yield of potato (q/acre) under different treatments of Sagarika liquid and granules along with recommended doses of fertilizer

Treatments	Yield (q acre^{-1})	Standard deviation	Standard error	Minimum	Maximum
100 % RDF + Water	97.58^{cd}	2.20	1.27	95.20	99.55
100 % RDF + 2.5 ml/l Sagarika liquid	102.66^{bc}	0.00	0.00	102.66	102.66
100 % RDF+5ml/l Sagarika liquid	104.69^{ab}	2.40	1.39	102.66	107.34
100% RDF+10kg/acre Sagarika granules	110.45^{a}	2.69	1.55	107.34	112.00
75%RDF+2.5ml/l Sagarika liquid	91.62^{e}	2.57	1.49	88.66	93.34
75%RDF+5ml/l Sagarika liquid	95.51^{de}	2.35	1.35	93.34	98.00
75 % RDF+10Kg/acre Sagarika granule	102.67^{bc}	0.93	0.54	101.74	103.60

*RDF= Recommended Dose of Fertilizer
**Letter on the top of number in the second column indicates the level of significance (0.05%) by DMRT (Duncen multiple range test)

Effect of Sagarika seaweed extract on Moong bean yield

The total grain and straw yield varied from 3.75 to 4.36 q acre $^{-1}$ and 14.07 to 16.24 q acre $^{-1}$. The maximum yield was observed with the application of 0.5 % of seaweed extract along with 100 % RDF, while minimum was with the application of 100 % RDF only. The straw yield was again maximum with the application of 0.5 % of seaweed extract along with 100 % RDF (16.24 q acre $^{-1}$). Though the straw yield was not significantly affected by the application of seaweed extract. Foliar application of 0.5 % of seaweed extract along with 100% recommended dose of fertilizer enhanced the grain yield by 16.27 % compared to control (Table 2). This was at par with the granular application of seaweed extract @ 10 kg/acre along with 100 % recommended dose of fertilizer (14.67 % more yield compared to control), 0.25 % of seaweed extract along with 100% recommended dose of fertilizer (14.13 % more yield compared to control) and 0.5 % seaweed extract along with 75 % RDF (14.40 % more yield compared to control). The grain yield (3.75 q acre^{-1}) was lowest with the application of only 100 % of RDF. On increasing the dose of seaweed extract in liquid form from 0.25 to 0.5 % non-significantly enhanced the yield by 1.86 %. The enhanced yield with the application of seaweed extract in general is because of presence of the bioactive

compounds like lipids, proteins, carbohydrates, amino acids, phytohormones, osmoprotectants, mineral nutrients.

Table 2. Effect of Sagarika liquid and Sagarika granule on total grain and straw yield of Moong

Treatments	Grain yield (q/acre)	Straw yield (q/acre)
100% RDF	3.75^{d}	14.17^{a}
100% RDF +2.5 ml/l Sagarika liquid	4.28^{ab}	15.25^{a}
100% RDF +5ml/l Sagarika liquid	4.36^{a}	16.24^{a}
100% RDF +10kg/acre Ssgarika granule	4.30^{ab}	16.19^{a}
75% RDF +2.5ml/l Sagarika liquid	4.27^{b}	14.07^{a}
75% RDF + 5 ml/l Sagarika liquid	4.29^{ab}	14.42^{a}
75% RDF +10kg/acre Sagarika granule	4.14^{c}	14.89^{a}

Seaweed extract as a liquid and granules significantly affected the number of pods per plants but number of grain per pod were not affected significantly by these treatments.

References

Badizadeoan M, Tafazoli E and Kheradnam M (1972) Effect of N^6 Benzyladenine on vegetative growth and tuber production in potato. Am. Potato J. 49: 109-116.

Humpries E C (1958) The effects of gibberellic acid and kinetin on the growth of Majestetic potato. Ann. Appi. Biol. 46: 346.

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