

Effect of Seradix-B1, B2 and B3 on the yield of Tapioca *Manihot esculenta* Syn. *Manihot utilissima*

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Tapioca is cultivated in Kerala over an area of about 5.5 lakh acres with an annual production of over 15 lakh tons of tuber **. There is increasing demand for tapioca tuber both as human food and as raw material for various industries. Importance of this crop in a State like Kerala, where severe food shortage is felt, cannot be overemphasised. Therefore, there is urgent necessity for stepping up the production of tapioca in Kerala.

Positive effects of hormones on earlier and better root development on a variety of crop plants have long been established by workers like Went and Thimann (1948), Gausman and co workers (1958), Kripal Singh, Bakshi and Sucha Singh (1960). Chant and Marden (1959) have established that IBA and other similar hormones induce root formation in tapioca.

Information on the effect of hormones on the development of root and stem tubers is scarce. Nevertheless, experiments by Peterson (1958) on sugar beet and experiments on sweet potato by Ito and Kato (1959) have indicated possibilities of promotion of tuberisation and increased yield as a result of hormone treatment. Srinivasan (1965) obtained increased number, as well

as increased total length, of roots in tapioca due to the application of root inducing hormone. Though the number of tubers formed per plant was not altered, higher tuber weight was obtained due to hormone treatment.

Encouraged by the results of studies indicating possibilities of higher tuber yield due to hormones, an experiment to study the effect of Seradix B1, B2 and B3 on the yield of tapioca was conducted during 1963-64 and in 1964-65 at the Agricultural College and Research Institute Vellayani.

Materials and Methods

The experiment was laid out in the red loam soils of the Agricultural College and Research Institute Farm in 1963-64 and was repeated in 1964-65. The crops were purely rainfed. The crop season was from June to April in both the years.

Tapioca variety H 105 was used for the experiment. This variety has proved its superiority in tuber yield over other improved and local varieties. (George and Sadanandan, 1962).

The treatments included three concentrations of Seradix-B, namely Seradix-B1

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** Source : Bureau of Economics and Statistics, Kerala.

4. Weight of stem per plant

Data on the weight of stem per plant due to various treatments are presented in Table IV.

Though the treatments had not significantly affected the stem weight per plant over the control there was a slight increase in the weight of stem over the control due to S1 treatment. S2 and S3 treatments depressed the weight of stem by 10.3% and 15% respectively.

5. Length of tuber per plant

Table V depicts the effect of hormone treatment on the length of tuber per plant. S2 treatment significantly increased the length of tuber over all other treatments, while S3 was significantly inferior to control but on a par with S1.

There was no significant difference between S1 and control. Srinivasan (1965) obtained similar results in tapioca.

TABLE IV
Mean weight of stem per plant over the two years

Treatment	Weight of stem (kg)
C	3.20
S 1	3.29
S 2	2.87
S 3	2.72
S. E.	0.64

TABLE V
Mean length of tuber per plant over the two years

Treatment	Average length of tuber (cm)
C	24.86
S 1	25.19
S 2	26.31
S 3	25.32
S. E.	0.92
C D (0.05)	0.77
Conclusion	S 2 S 3 S 1 C

Summary and Conclusions.

A detailed investigation on the effect of Seradix-B1, B2 and B3 on the tuber development of tapioca carried out in the

Agricultural College and Research Institute Farm, Vellayani, for two years (1963-64 and 1964-65) gave the following results:

The higher yields due to hormone treatment obtained are in agreement with the findings of Peterson (1958) on Sugar beet and Ito and Kato (1959) on Sweet Potato.

2. Number of tubers per plant

The number of tubers per plant as affected by various treatments is given Table II. None of the treatments significantly affected the number of tubers per plant over the control. S3 treatment gave the maximum

number of tubers (15.4), while S1 gave the least number of tubers (13.3) per plant.

A comparison of data in Tables I and II indicates that as the number of tubers per plant decreased, the weight of tuber per plant increased. S1 treatment gave the least number of tubers per plant (13.3) and it recorded the maximum weight of 2.927 kg tuber per plant, while S3 with an average of 15.4 tubers recorded only 2.801 kg of tuber per plant.

TABLE II
Mean number of tubers per plant over the two years

Treatment	Average number of tubers
C	15.0
S 1	13.3
S 2	14.5
S 3	15.4
S. E.	3.4

3. Weight of tuber per hectare

The application of hormones S1 and S2 gave 11.1% and 7.4% respectively of higher tuber yield over the control, while S3 gave 0.9% lesser yield than the control. But

none of these was statistically significant (Table III).

Similar trend was noticed with S1 and S2 treatments in the per plant tuber yield also. This is in accordance with the results obtained by Srinivasan (1965).

TABLE III
Mean weight of tuber per hectare over the two years

Treatment	Average yield of tuber (kg)
C	18263
S 1	20298
S 2	19625
S 3	18101
S. E.	202.9

(treatment S1), B2 (treatment S2), B3 (treatment S3) and a Control (treatment C). Seradix is a proprietary product of M/s May and Baker Company containing β -indole 3-butyric acid as active root promoting chemical. B1 is a pink coloured powder for soft cuttings, B2 is white in colour recommended for medium cuttings and B3 is grey coloured and meant for hard cuttings.

The experiment was laid out in randomised block design with six replications and the above mentioned four treatments. Each plot had twelve treated plants.

The experimental site was ploughed four times to obtain a uniform desirable tilth for tuber growth of tapioca. Farm Yard Manure at the rate of two cart loads per acre was incorporated with the soil at the time of last ploughing. The land was dug once to cover the area left over by ploughs. Base portions of 9 inch long tapioca setts were dipped in the respective Seradix preparations and were tapped against the rim of the container to remove any surplus powder from the setts and were planted vertically on top of the mounds prepared at four feet either way. Plantings were done on 10-7-1963 and 26-6-1964.

The crops were intercultivated five weeks after planting and were top dressed with tapioca mixture (8: 8: 16) at the recommended dose of 600 kg/ha in shallow trenches made all around the sides of the mounds. The trenches were covered with soil after the application of the mixture.

Harvesting of tuber in the two seasons was done on 22-4-64 and 5-4-65 respectively.

Data from the various observations taken during the two years were combined and analysed. The following characters were studied.

1. Weight of tuber per plant.
2. Number of tubers per plant.
3. Weight of tuber per hectare.
4. Weight of stem per plant.
5. Length of tuber per plant.

Results and Discussion

1. Weight of tuber per plant

The data as detailed in Table I show that none of the treatments increased the weight of tuber per plant over the control significantly. However, the various treatments tended to increase the tuber weight, S1 treatment gave the maximum increase of 17.9% over the control followed by S2 and S3 with 14.7% and 12.9% respectively.

TABLE I

Mean weight of tuber per plant over the two years

Treatment	Weight of tuber (kg)
C	2.483
S 1	2.927
S 2	2.847
S3	2.81
S. E.	0.784

Seradix-B 1 (S 1)

Though seradix-B1 had no effect in significantly increasing the weight of tuber per plant, length of tuber, number of tubers and the weight of stem per plant, it exhibited a trend in increasing the weight of tuber per plant by 17.9% over control.

Seradix-B2 (S 2)

Except in the length of tubers this treatment also had no significant effect on any of the characters studied. However, it showed a trend in increasing the weight of tuber per plant by about 14.7% over the control. Though seradix-B2 did increase the tuber length, other characters have not favourably contributed for increasing the yield of tubers over Seradix-B1 and B3.

Seradix-B 3 (S 3)

This treatment also significantly increased the length of tuber over the control while none of the other characters was significantly affected. This treatment gave only a 12.9% increase in the yield of tuber per plant over the control.

Taking the yield of tuber as the important factor, it appears that Seradix-B1 followed by B2 and B3 should be the order of preference.

Further investigations on the effect of Seradix-B1 on various improved varieties of tapioca have to be taken up to assess its economic use in increasing the production of tapioca tubers.

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