

Effect of Foliar Feeding of Commercial Formulations of Growth Regulators and Micronutrients on Some Physico-Chemical Characters of Pineapple (cv Kew)

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Abstract

An experiment was laid out to study the effect of different commercial formulation of growth regulators and micronutrients on some physical and quality attributes of fruits of pineapple during 2006-07. Seven different treatment combinations of commercial formulation of growth regulators (cytozyme and biozyme) and micronutrients (tracel-2) were evaluated against the control (distilled water). Though each formulation has beneficial role in improving the fruit physical and quality characters of fruits of pineapple, the treatment combination cytozyme at 0.10% + tracel 2 at 0.40% was the best in this regard.

Key words : Pineapple, Foliar feeding, Growth regulators, Micronutrients, Fruit quality.

Significant effects of different micronutrients and growth regulators on physico-chemical characters of various fruit crops have been reported (1, 2). Instead of applying specific micronutrients in single form in recommended doses the farmers generally use different trade products available in market. They also use some corporate products of growth regulators for boosting their crop production. Information regarding definite effects of these products on pineapple especially in the pineapple export zone of West Bengal are scanty. Hence, the investigation was planned to sum up the results of foliar feeding of two growth regulators (cytozyme and biozyme) and micronutrient mixture (tracel-2) on pineapple.

Methods

The study was carried out at Regional Research sub-Station, Khoribari, Uttar Banga Krishi Viswavidyalaya of West Bengal during 2006-07. The experiment was conducted in a simple randomized block design with eight treatments and having three replications in each treatment. The treatments were T₁ : Cytozyme at 0.10%, T₂ : Biozyme at 0.05%, T₃ : Tracel 2 at 0.40%, T₄ : Cytozyme at 0.10% + Biozyme at 0.05%, T₅ : Cytozyme at 0.10% + tracel 2 at 0.40%, T₆ : Biozyme at 0.05% + tracel 2 at 0.40%, T₇ : Cytozyme at 0.10% + biozyme at 0.05% + tracel 2 at

0.40% and T₈ : Control (distilled water spray). Cytozyme is a growth regulator formulation from SPIC Ltd., Chennai containing GA₃ at 0.001% and generally used at 1 ml/liter. Biozyme contains sea weed (*Ascophyllum nodosum*) extract which is a source of natural growth hormones and is used at 90 ml/450 liter of water per ha. The experiment was carried out on newly established field of current season growth with plant population of 64,000/ha (spacing : 25 cm × 35 cm × 90 cm). Growth regulators and micronutrient mixture were sprayed twice, once at 25 days after flowering and again at 45 days after flowering. The used chemicals were compatible to each other. Uniform cultural practices were followed based on recommendation. The physico-chemical analyses were done on five randomly selected mature fruits at one-fourth coloring stage from each replication. Different biochemical characters like total soluble solids (TSS), titratable acidity and total sugar content were estimated by methods described by AOAC (3). The findings of the experiment were statistically analyzed following the methods described by Panse and Sukhatme (4).

Results and Discussion

Results of the present experiment revealed the variation in fruit physical characters and quality

Table 1. Physical and quality characters of fruits of pineapple influenced by commercial formulation of growth regulators and micronutrients.

Treatments	Fruit physical characters				Fruit quality characters			
	Fruit weight (kg) with crown	Fruit weight (kg) without crown	Fruit length (cm)	Fruit girth (cm)	TSS (^o Brix)	Titrateable acidity (%)	Total sugar (%)	TSS : Acid ratio
T ₁ : Cytozyme 0.10%	1.384	1.042	14.7	35.9	12.8	0.64	10.7	19.97
T ₂ : Biozyme 0.05%	1.411	1.034	14.5	35.6	12.6	0.69	10.5	18.09
T ₃ : Tracel 2 0.40%	1.353	0.981	14.8	35.3	13.0	0.61	10.7	21.26
T ₄ : Cytozyme 0.10% + Biozyme 0.05%	1.420	1.083	15.0	35.6	12.5	0.67	10.4	18.00
T ₅ : Cytozyme 0.10% + Tracel 2 0.40%	1.450	1.100	15.1	36.3	12.9	0.64	11.1	20.24
T ₆ : Biozyme 0.05% + Tracel 2 0.40%	1.395	1.050	14.1	35.7	12.8	0.66	10.8	19.35
T ₇ : Cytozyme 0.10% + Biozyme 0.05% + Tracel 2 0.40%	1.367	1.089	15.1	35.9	13.1	0.65	10.9	20.16
T ₈ : Control (distilled water spray)	1.364	1.030	14.7	35.5	12.5	0.69	10.2	18.13
CD (5%)	0.024	0.026	0.255	0.424	0.169	0.595	0.168	0.031
SE (±)	0.052	0.056	0.546	0.909	0.362	1.275	0.361	0.143

characters in respect to different commercial growth regulators and micronutrients (Table 1).

Fruit Physical Characters

Significantly highest fruit weights with crown (1.450 kg) and without crown (1.100 kg) were observed in the plants sprayed with cytozyme at 0.10% + tracel 2 at 0.40%. Maximum fruit length (15.1 cm) was observed also in the plants sprayed with similar treatment and with mixture of cytozyme at 0.10% + biozyme at 0.05% + tracel 2 at 0.40% was at par with the previous treatment in the same observation. Highest fruit girth (36.3 cm) was recorded under the treatment cytozyme at 0.10% + tracel 2 at 0.40% which was at par with the fruits under treatment cytozyme at 0.10% + biozyme at 0.05% + tracel 2 at 0.40% (35.9 cm) and cytozyme at 0.10% (35.9 cm).

Fruit Quality Characters

Among different fruit quality characters total soluble solids (TSS) content of the fruits was recorded to be maximum (13.1 ^oBrix) under the treatment cytozyme at 0.10% + biozyme at 0.05% + tracel 2 at 0.40% which was statistically at par with TSS content of fruits under the treatment tracel 2 at 0.40%. The acid content or titrateable acidity of the fruits under different treatments were found to be non-significant i.e. statistically all are similar. But the total sugar con-

tent of the fruits was highest (11.1%) under the treatment cytozyme at 0.10% + tracel 2 at 0.40%. Highest TSS : Acid ratio (21.26) was noted in the treatment tracel 2 at 0.40%. TSS : Acid ratio of 20.24 and 20.16 were also recorded under the treatments cytozyme at 0.10% + tracel 2 at 0.40% and cytozyme at 0.10% + biozyme at 0.05% + tracel 2 at 0.40% respectively.

Maximum fruit dimension (in respect to fruit length and girth) and fruit weight were noted under the combined spray treatment of cytozyme and tracel 2. It may be due to the presence of gibberellic acid in cytozyme and presence of boron and zinc in tracel 2. Kar et al. (2) reported that the increase in fruit size and fruit weight of pineapple with application of different levels of boron and zinc. Besides the boron, zinc and manganese contents of the tracel 2 might be helpful in the growth metabolism of pineapple fruits. According to Coombe (5) regulatory role of zinc is mediated through auxin induced accumulation of water and soluble metabolites within the cell sap cause the cell enlargement and ultimate growth of the plant tissue. Ghosh et al. (1) also noted the beneficial effect of tracel 2 in fruit yield of mango. Increase in the fruit dimension and fruit weight in mango with spraying with GA₃ was reported by Sarkar and Ghosh (6) and Rajput and Singh (7). Maximum TSS and total sugar were observed in the fruits under treatment of trace l2 (solo application and combination with others). It might be due the positive role of boron in translocation of the metabolites into fruits.

Thus it can be concluded that all the growth regulator formulations and micronutrient formulations were beneficial to the physico-chemical characters of pineapple. But the combined application of cytozyme at 0.10% and trazel 2 at 0.40% was most effective to get better size and quality of pineapple.

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