International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2019; 7(5): 2339-2341

Received: 16-07-2019
Accepted: 18-08-2019

Lakhee Kadegiya
Department of Horticulture, College of Agriculture, Junagadh Agricultural University, Junagadh, Gujarat, India

VR Malam
Department of Horticulture, College of Agriculture, Junagadh Agricultural University, Junagadh, Gujarat, India

JS Parsana
Department of Horticulture, College of Agriculture, Junagadh Agricultural University, Junagadh, Gujarat, India

RL Chitroda
Department of Horticulture, College of Agriculture, Junagadh Agricultural University, Junagadh, Gujarat, India

SM Makwana
Department of Horticulture, College of Agriculture, Junagadh Agricultural University, Junagadh, Gujarat, India

Rutu Solanki
Department of Horticulture, College of Agriculture, Junagadh Agricultural University, Junagadh, Gujarat, India

Corresponding Author:
Lakhee Kadegiya
Department of Horticulture, College of Agriculture, Junagadh Agricultural University, Junagadh, Gujarat, India

Effect of chemical sprays on physical and yield parameters of ratoon banana (*Musa paradisiaca* L.) cv. Grand naine

Lakhee Kadegiya, VR Malam, JS Parsana, RL Chitroda, SM Makwana and Rutu Solanki

Abstract
An experiment entitled Effect of chemical sprays on quantity parameters of ratoon banana (*Musa paradisiaca* L.) cv. Grand Naine was conducted at Fruit Research Station, Jamuvadi Farm, Department of Horticulture, Junagadh Agricultural University, Junagadh during the year 2018- 2019. The treatments included GA_3 100 ppm, SOP 1.5%, brassinosteroid 2 ppm, $CaCl_2$ 0.75%, KH_2PO_4 2.0%, KCl 1.0% and water spray (control). The first spray was given immediately after complete opening of the bunch and second spray was given at 15 days after first spray. Among the treatments sprayed with SOP 1.5% shorted in the maturity period and sprayed with brassinosteroid 2 ppm produced maximum finger length, finger girth, finger weight, weight of hand, bunch weight and fruit yield.

Keywords: Banana, grand Naine, chemicals, physical, yield

Introduction
Bananas and plantains (*Musa spp*.) are one of the most important commercial food crops especially in the tropics. Eve was said to have used banana leaves to cover her modesty in the Garden of paradise as revealed from antiquity. Banana is thus called 'Apple of Paradise' and also known as 'Adam's fig'. Banana is a perennial, herbaceous, monocotyledonous and monocarpic crop. It belongs to the family Musaceae in the order Scitamineae and native to South East Asia. Banana crop has famous from antiquity to nutritional, medicinal and industrial value. Any limitation in the supply of nutrients at this problem, poor filling and development of fingers is often reported in almost all cultivars of commercial importance hence additional dose of fertilizer (sulphat of potash) after shooting become imperative. Many reports have indicated the usefulness of post shooting spray of various nutrients during fruit development in influencing the fruit yield. Therfore, this research work is planned in the field to find out the effect of chemical sprays on bunch of ratoon banana cv. Grand Naine.

Material and Methods
The experiment was laid out at Fruit Research Station, Jambuwadi Farm, Department of Horticulture, Junagadh Agricultural University, Junagadh during the year 2018- 2019 to Effect of chemical sprays on quantity parameters of ratoon banana (*Musa paradisiaca* L.) cv. Grand Naine. The fruit from this experiment were harvested and brought to the laboratory of Department of Horticulture, Junagadh Agricultural University, Junagadh. The experiment was lay out in Randomized Block Design with three replication and seven treatments.

Treatment details
1. T_1: GA_3 100 ppm
2. T_2: SOP 1.5%
3. T_3: Brassinosteroid 2.0 ppm
4. T_4: $CaCl_2$ 0.75%
5. T_5: KH_2PO_4 2.0%
6. T_6: KCl 1.0%
7. T_7: Control (Water spray)

The bunch sprayed twice first spray after complete opening of bunch and second spray 15 days after first spray. The parameters were recorded *viz.* days required bunch opening to harvesting, finger length, finger girth, finger weight, weight of hand, bunch weight and fruit yield. Results thus, obtained were subjected to statistical analysis.

Results and Discussion

It is evident from data presented in Table 1 that minimum days (84.91) taken from bunch opening to harvesting was recorded when bunch was sprayed with SOP 1.5% and maximum days (100.26) in control. It is clear from the data that the application of sulphate of potash gave the promising result by advancing the harvesting of banana bunches. In bunch spray of chemicals investigation, the reduction in days required from bunch opening to harvesting is due to faster growth rate of fingers and higher leaf chlorophyll contents owing to additional nutrient supply and faster rate of translocation of assimilates from source to sink, aided by additional potassium because it is a general metabolic activator increasing the respiration and photosynthetic rate. Thus, additional K application as foliar spray minimized days from flowering to harvesting (Evans, 1971; Martin and Prevel, 1972) [5, 9]. Similar results were also reported by Kumar *et al*. (2008) [8] and Kumar and Kumar (2010) [7] in banana.

The data presented in Table 1 that the highest finger length (15.63 cm),finger girth (14.98 cm) finger weight (162.97 g), weight of hand (2.69 kg), bunch weight (17.10 kg) and fruit yield (92.16 t/ha)was recorded in T_3 (brassinosteroid 2 ppm) treatment and minimum finger length (10.42 cm), finger girth (10.42 cm),finger weight (92.63 g), weight of hand (1.76 kg), bunch weigh (9.23 kg) and fruit yield (72.27 t/ha)was recorded in control. Brassinosteroids 2 ppm has growth promoting effects similar to auxin and gibberellins and found to have promising effects on cell elongation by increasing the cell permeability to water and osmotic solutes of the cells. It might be possible that spray of brassinosteroid concentrations increased sensitivity of auxin (Zhang *et al*., 2009) [13]. Besides, auxins like characters of BRs are also responsible for inducing the synthesis of specific DNA dependent new m-RNA and specific enzymatic proteins causes increased cell plasticity and extension resulting ultimately in cell enlargement. Brassinosteroid 2 ppm improved the yield by regulating the function in cell elongation and cell division (Clouse and Sasse, 1998) [4]. It induces cell division, elongation and differentiation and stimulates photosynthetic activity by accelerating CO_2 fixation and further increasing protein biosynthesis. Besides, BR is known to promote nucleic acid level, nitrogen fixation and enhance soluble protein content and increase in DNA and RNA concentrations. Apart from these physiological responses, brassinosteroids has growth promoting effects similar to auxin and gibberellins and found to have promising effects on total yield improvement (Vardhini *et al*. 1998) [12]. Similar results were revealed by Mulagund *et al.,* (2015) [10] in banana, Sugiyama and Kuraishi (1989) [11] and ChaFang *et al*. (2004) [3] in orange, Champa *et al*. (2015) [2] and Bhat *et al*. (2011) [1] in grapes and Gomes *et al.* (2006) [6] in yellow passion fruit.

Table 1: Effect of chemical sprays on physical parameters of ratoon banana

Treatments	Days required from bunch opening to harvest	Finger length (cm)	Finger girth (mm)	Finger weight (g)	Weight of hand (kg)	Bunch weight (kg)	Fruit yield (t/ha)
T_1	96.44	15.02	13.49	129.43	2.16	14.15	90.05
T_2	84.91	12.63	13.24	127.48	2.46	10.05	78.32
T_3	90.63	15.63	14.98	162.97	2.69	17.10	92.16
T_4	92.14	12.83	12.56	136.86	2.42	9.69	73.75
T_5	91.34	12.45	12.29	125.86	2.61	13.13	81.48
T_6	91.86	13.66	11.23	122.55	1.87	10.48	74.83
T_7	100.26	10.58	10.42	92.63	1.76	9.23	72.27
S.Em.±	2.73	0.55	0.57	4.39	0.17	0.50	3.74
C. D. at 5%	8.40	1.69	1.74	13.53	0.51	1.54	11.53
C. V.%	5.10	7.18	7.78	5.93	12.54	7.21	8.06

Conclusion

Banana bunches sprayed twice, first immediately after complete opening of bunch and second 15 days after first spray with SOP 1.5% shortened the maturity period and brassinosteroid 2 ppm found effective for higher finger length, finger girth, finger weight, weight of hand, bunch weight and fruit yield.

References

1. Bhat ZA, Reddy YN, Srihari D. New generation growth regulators – Brassinosteroid and CPPU improve bunch and berry characteristics in 'Tas -A – Ganesh' grape. International J Fruit Sci. 2011; 11:309-315.
2. Champa HWA, Gill MIS, Mahajan BVC, Aror NK, Seema B. Brassinosteroids improve quality of table grapes (*Vitis vinifera* L.) cv. Flame Seedless. Tropi. Agri. Res. 2015; 26(2):368-379.
3. Chang Fang W, Young Feng C, Xue Song Lu, Jun W, Jinshi W. Adjusting effect of brassinolide and GA_3 on the orange growth Acta Agril. Jian. 2004; 26(5):759-762.
4. Clouse SD, Sasse JM. Brassinosteroids; Essential regulators of plant growth and development. Annu. Rev. plant physiol. 1998; 49:427-451.
5. Evans LT. Flower induction and the floral concept. Rev. Pl. Physiol. 1971; 22:365- 394.
6. Gomes MMA, Campostrini E, Rocha N, Viana LAP. Brassinosteroid analogue effects on the yield of yellow passion fruit plants (*Passiflora edulis f. flavicarpa*). Sci. Hort. 2006; 110:235-240.
7. Kumar AR, Kumar N. Effect of post shooting spray of certain nutrients on yield and quality of banana cv. Neypoovan (AB). Agric. Sci. Digest. 2010; 30(2):125-128.
8. Kumar AR, Kumar N, Jeyakumar P. Effect of post-shooting spray of Sulphate of Potash (SOP) on yield and quality of banana cv. Robusta (AAA Cavendish). Res. J Agric. Biol. Sci. 2008; 4(6):655-659.
9. Martin, Prevel P. Banana In: World Fertilizer Use Manual. Wichman, W. (ed.) International Fertilizer Industry Association, Paris, 1972, 398- 409.

10. Mulagund J, Kumar S, Soorinathasundaram K, Porika H. Influence of post – shooting sprays of Brassinosteroid on bunch characters and fruit yield of banana cv. Nendran. The Bioscan. 2015; 10(1):153-159.
11. Sugiyama K, Kuraishi S. Stimulation of fruit set of 'Morita' navel orange with brassinolide. VI international Symposium on Growth Regulators in Fruit Production. Acta Horticulturae. 1989; 239:345-348.
12. Vardhini B, Vidya, Rao SR. Effect of brassinosteroids on germination of groundnut (*Arachis hypogaea* L.) seeds. Indian J Plant Physiol. 1998; 1(3):223-224.
13. Zhang S, Wei Y, Lu Y, Wang X. Mechanisms of brassinosteroids interecting with multiple hormones. Plant Signal Behav. 2009; 4:1117-1120.