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Estimates of chemicals & bagging along with physical traits of rainy season guava (*Psidium guajava* Linn.) Cv. Lucknow-49

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Abstract

The study was started from June 2017 to assess the “Estimates of chemicals & bagging along with physical traits of rainy season guava (*Psidium guajava* Linn.) CV. Lucknow-49” at the Main Experiment Station and Post Harvest Technology Laboratory of Horticulture, Narendra Deva University of Agriculture and Technology, Faizabad (U.P.). The fruits of rainy season or Ambe bahar guava crop are very poor in quality, having poor shelf life and numbers of fruits are infested with insect pests and diseases particularly fruit flies and anthracnose respectively. These problems occur due to prevalence of warm and humid condition in rainy season. To overcome these problems, the present investigation was formulated with nine pre-harvest treatments viz. T₁ (CaCl₂ @ 2%), T₂ (salicylic acid @ 3%), T₃ (polythene + CaCl₂ @ 2%), T₄ (polythene + salicylic acid @ 3%), T₅ (blue polythene + CaCl₂ @ 2%), T₆ (blue polythene + salicylic acid @ 3%), T₇ (violet polythene + CaCl₂ @ 2%), T₈ (violet polythene + salicylic acid @ 3%) and T₉ (Control). The treated fruits were harvested at ripe stage and stored at ambient condition.

Keywords: polythene, anthracnose, salicylic acid, ambient

1. Introduction

Guava belongs (*Psidium guajava* Linn.) to the family Myrtaceae and genus Psidium. It is originated from Tropical America (Peru). It has been cultivated in India since early 17th century. Which has a tropical fruit but also grows well in sub-tropical conditions. Guava has been popularly known as “apple of tropics” it is most common and major fruit of India and considered the fifth most important fruit in area and production after mango, citrus, banana, and apple. India is one of the highest guava producing countries in the world with a production of 39.16 lakh tonnes from area 2.61 lakh ha and productivity of 13.7 MT/ha (NHB Database, 2016-17 and Maharashtra leads in total area under guava whereas, Uttar Pradesh is in 3rd position. District Allahabad has the reputation of growing the best guava in the country as well as in the world.

The important guava producing countries are India, Mexico, Brazil, Cuba, Venezuela, Australia, South Africa, Thailand, Malaysia, Indonesia, China, Sri Lanka, Philippines, Bangladesh, Myanmar, Dominican Republic, USA (Hawaii, Florida and California) and Haiti. It is one of the important fruits of India and it is considered to be the poor man’s apple. It has adopted in India so well that it appears to be an Indian fruit. Guava is considered as one of the exquisite, nutritionally valuable and remunerative crops. Guava fruits are used for both, fresh consumption and processing. Guava is one of the richest natural sources of vitamin-C containing 2 to 5 times more vitamin-C than oranges and 10 times more than tomatoes. Compared to other fruits, the whole guava is a moderately good source of calcium, a fair source of phosphorus and good source of iron.

A lot of varieties are known to exist in India. The most well known varieties are Allahabad Safeda, Lucknow-49 (*Sardar guava*), Pear Shaped, Behat Coconut, Apple Colour, Red Fleshed, Pant Prabhat, Arka Amulya, Arka Mridula, Lalit, and Shweta, Lucknow-49 (*Sardar Guava*) is one of the most important cultivars of guava, a seedling selection of Safedais a Semi-dwarf tree, vigorous, heavy branching type with flat crown, large elliptic-ovate to oblong shaped leaves and large roundish ovate shaped fruits with primrose-yellow skin colour,

occasionally having red dots on the skin. It is having sweet taste and excellent keeping quality.

Generally, three fruiting seasons are found in guava i.e. Ambe bahar, Mrig bahar and Hasth bahar. Among these, Mrig bahar guava is the best in quality and Ambe bahar guava is the poorest. The fruits harvested in these seasons are insipid, watery, poor in quality, attacked mostly by diseases and pests. Anthracnose (*Gloeosporium psidii*) is one of major disease that adversely affect quality of guava in rainy season. Infestation with fruit fly (*Dacus dorsalis*) has been a major impediment to guava marketing specially during rainy season. Keeping quality of Ambe Bahar guava fruits is very poor. Hence this season crop is always minimized or removed by crop regulation or Bahar treatment methods. Again, year round production is an important factor which cannot be achieved due to removal of this crop. Hence, it is a great hurdle in the annual production of guava. Several attempts have been carried out by various research workers in different countries to solve the above problems in Ambe Bahar guava fruits.

2. Materials & Methods

The present investigation entitled “Estimates of chemicals & bagging along with physical traits of rainy season guava (*Psidium guajava* Linn.) CV. Lucknow-49” was carried out at the guava orchard at Main Experiment station of Horticulture and Post Harvest Technology laboratory, Department of Post Harvest Technology, College of Horticulture and Forestry, Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad (U.P.) during the *kharif* season of 2016-17. The present experiment comprising nine different treatments involving spraying of chemicals and covering with different types of bags was carried out in Randomized block design with three replications.

3. Results & Discussion

3.1 Fruit Size

The data pertaining to the effect of pre harvest treatments on fruit size of guava cv. L-49 expressed as length and width are presented in table 1.

Table 1: Effect of pre harvest treatments on size and weight of fruits in guava cv. Lucknow-49.

Treatments	Fruit length (cm)	Fruit width (cm)	Fruit weight (g)
T ₁ - CaCl ₂ @ 2%	4.15	3.49	106.70
T ₂ - Salicylic acid @ 3%	4.05	3.37	95.0
T ₃ - Polythene+CaCl ₂ @ 2%	5.26	4.80	116.0
T ₄ - polythene+ Salicylic acid @ 3%	5.37	5.23	133.0
T ₅ - Blue polythene+CaCl ₂ @ 2%	5.28	4.95	129.34
T ₆ - Blue polythene +Salicylic acid @ 3%	5.35	5.10	131.0
T ₇ - Violet polythene+CaCl ₂ @ 2%	5.27	4.90	120.0
T ₈ - Violet polythène +Salicylic acid @ 3%	5.25	4.70	113.34
T ₉ - Control	4.0	3.24	83.70
SEm _±	0.27	0.41	7.05
CD at 5%	0.83	1.24	21.13

An examination of data revealed that all the pre harvest treatments influenced the fruit size. Increase in both length and width was noted due to pre harvest treatments. The maximum fruit length of 5.37 cm and width of 5.23 cm were recorded in plants treated with Polythene bag+ salicylic acid @ 3% followed by the plants treated with Blue Polythene bag +salicylic acid @ 3% i.e. 5.26 cm length and width.5.10 cm. All fruits covered with polythene bag under different treatment were found at par in respect of length and width of fruit. The minimum fruit length 4.0cm and width of 3.24 cm were noted in control.

3.2 Fruit weight

Introspection to data presented in table 1 revealed that fruit weight increased progressively due to all pre harvest treatments.

Out of all pre harvest treatments the maximum fruit weight was recorded in treatment (Polythene + salicylic acid) i.e. 133 g followed by 131 g in plants treated with blue polythene + CaCl₂ @ 2%. The minimum fruit weight was noted in Control i.e. 83.6 g.

The bagged fruit were found significantly more fruit weight in comparison to un-bagged fruit.

3.3 Fruit Firmness

The data presented in the table 2 showed that fruit firmness increased significantly due to all pre harvest treatments.

The fruits from plants treated with violet polythene bag + salicylic acid @ 3% were the most firm with firmness value of 9.51 kg/cm² followed by the pre harvest treatment of blue polythene bag +salicylic acid @ 3% with firmness value of 9.47kg/cm² and polythene bag +salicylic acid @ 3% with firmness value of 9.46 kg/cm². The lowest firmness value of 8.54 kg/cm² was recorded in Control.

Fruit plant treated with salicylic acid along with different colour polythene bag scored maximum firmness value as compared to calcium chloride treated plant and control.

3.4 Spotted fruits

The data on percentage of spotted guava fruits is presented in Table-2. Minimum spotted fruits were found in plants treated with different colour of polythene bag + calcium chloride / salicylic acid per cent varying from 0.82 to 1.01%. The fruit plant treated with calcium chloride or salicylic acid alone recorded more no spotted fruit per cent varying from 28.33 to 24.85 %.The maximum percentage of spotted fruits has been found 60.73% in control.

Table 2: Effect of pre harvest treatments on fruit firmness and percentage of spotted and infested fruits.

Treatments	Firmness(Kg/ cm ²)	Spotted fruits (%)	Infested fruits (%)
T ₁ CaCl ₂ @ 2%	9.13	28.33(5.28)	19.20(4.43)
T ₂ Salicylic acid @ 3%	9.16	24.85(4.96)	18.50(4.35)
T ₃ Polythene+CaCl ₂ @ 2%	9.42	0.91(0.95)	0.06(0.74)
T ₄ polythene+ Salicylic acid @ 3%	9.46	1.01(1.00)	0.12(0.78)
T ₅ Blue polythene+CaCl ₂ @ 2%	9.41	0.90(0.94)	0.06(0.74)
T ₆ Blue polythene +Salicylic acid @ 3%	9.47	0.97(0.97)	0.09(0.77)
T ₇ Violet polythene+CaCl ₂ @ 2%	9.43	0.98(0.99)	0.10(0.78)
T ₈ Violet polythene+Salicylic acid @ 3%	9.51	0.82(0.88)	0.02(0.73)
T ₉ Control	8.54	60.73(7.79)	21.55(4.69)
SEm±	0.11	0.14	0.024
CD at 5%	0.33	0.63	0.30

3.5 Infested fruits

The data pertaining to the effect of pre harvest treatments on percentage of infested fruits during harvesting and storage in ambient condition is presented in Table 2.

It is apparent from the data on the effect of pre harvest treatments with bagged fruits showed very less infestation where as, maximum fruit infestation of 21.55 % was recorded in control. Followed by only chemicals treated fruits varying with 19.20 to 18.50 %.

4. Summary & Conclusion

4.1 Fruit Size

Environmental factors play a major role in controlling size of fruit which was cleared from the present investigation. All the pre harvest treatment created microclimate for fruits which became feasible for increase in fruit size i.e. length and width. The maximum fruit length of 5.37 cm and width of 5.23 cm were recorded in plants treated with Polythene bag+ salicylic acid @ 3% Minimum fruit length and width were obtained in control i.e. 3.5 cm and 3.8 cm respectively.

4.2 Fruit Weight

Result obtained in present findings showed that all the pre harvest treatments significantly improved the fruit weight over the control. The treatment of Polythene + salicylic acid @ 3% produced the guava fruits with maximum average fruit weight (133 g) and minimum was recorded in control (86.6g).

4.3 Fruit firmness

Data on fruit firmness showed that all the pre harvest treatments effectively increased the fruit firmness of guava fruits over the control. The highest firmness was recorded in treatment of violet polythene bag+ salicylic acid @ 3% (9.51 kg/cm²) followed by the treatment of Blue polythene bag + salicylic acid @ 3%(9.47 kg/cm²), although lowest fruit firmness (8.54 kg/cm²) was recorded in control.

4.4 Spotted fruits

The present findings showed that minimum spotted fruits were noted with the treatment of Violet polythene+ salicylic acid @ 3% followed by violet polythene+CaCl₂ @ 2% i.e. 0.80% and 0.90% and maximum spotted fruits were noted in control i.e. 60.73%. Spots on fruits occur mainly due to high humid condition because it is congenial for pathogen attack. This can only be cured by protecting the fruits from hazardous effect of environment.

4.5 Infested fruits

Results obtained from the investigation showed that very less infested fruit was found in the pre harvest treatments of polythene bag alone and it's combination with other

treatments i.e. Polythene bag +CaCl₂ @ 2% and salicylic acid @ 3%+ polythene bag, while the highest infested fruits were recorded in control i.e. 21.55%. Infestation is 2 types i.e. disease infestation and insect pest infestation. Disease like anthracnose and pest like fruit fly mainly occur during rainy season because of suitable climate for their growth.

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