Indian Journal of Agriculture and Allied Sciences
A Refereed Research Journal

ISSN 2395-1109
Volume: 1, No.: 1, Year: 2015

EFFECT OF DIFFERENT BUNCH COVERS ON FRUIT QUALITY AND SHELF LIFE OF RED BANANA

Pratyush Kumar, Dhruv Kumar Prasad and S. Saravanan
Department of Horticulture, Sam Higginbottom Institute of Agriculture Technology and Sciences, Allahabad–211 007

Abstract: *An investigation was carried out in the field at Department of Horticulture SHIATS, Allahabad to find out the effect of different bunch covers on Red banana. Bunches were bagged with transparent, blue, red, black, white polythene bags of 200 gauge thickness. The colour of bunch cover significantly and non significantly influenced the highest fruit length, fruit girth, fruit weight, days to maturity, bunch weight, peel colour, green life, red life, TSS, pulp peel ratio, acidity, reducing sugars, non reducing sugars, total sugars, sugar PLW, colour, flavour, texture, taste and over all acceptability were recorded in the bunches covered by transparent polythene cover followed by fruits covered black polythene and the lowest was observed in control.*

Key Words: *Red Banana fruit growth, yield and quality parameters and Coloured Polythene*

Introduction: Banana (*Musa* sp.) is the second most important fruit crop in India next to mango. Its year round availability, affordability, varietal range, taste, nutritive and medicinal value makes it the favourite fruit among all classes of people. It has also good export potential (NHB). Proper bunch management technologies, particularly covering bunches with polyethylene bags is a common practice in several banana exporting countries. It has been observed that the bags not only increase bunch size and weight but also protect the fruit surface against pathogens, wind damage, leaf and petiole scarring, dust, light hail, sunburn, bird feeding and also affect the post harvest quality of the fruits. In the present investigation an attempt has been made to study the effect of bunch covering on fruit quality, yield and shelf life of Red Banana.

Materials and Methods

Investigations on development of pre and post harvest packages for export Red Banana (*Musa paradisica* .L) was under taken at field of Department of Horticulture, SHIATS, Allahabad. The experiment was carried out in a standing crop. The plants were collected from SPIC Biotech Coimbatore, Tamil Nadu. Bunches were bagged or covered after the opening of first female bract with transparent, blue, red, black, white polythene bags of 200 gauge thickness and 1.5 m x 1 m size. Five plants from replicate were tagged for recording the data. The treatments and replications were allotted randomly. Harvesting of bunches were begun after 116 days (90% maturity). The bunches were harvested carefully using a sharp knife, transported immediately to the laboratory for observation on post harvest fruit and bunch characters like fruit length, fruit girth, fruit weight, days to maturity, bunch weight, peel colour, green life, red life, TSS, pulp peel ratio, acidity, reducing sugars, non reducing sugars, total sugars, sugar PLW, colour, flavour, texture, taste and over all acceptability. The experiment was laid out in CRD with 6 treatments five different colored polythene treatments including with control and 5 plants for replications.

Results and Discussion

The result on the post harvest as influenced by the use of different bunch covers in successive year are presented in table 1 and Table 2. The fruit harvest at 90% maturity when observed, the fruit covered with transparent polythene showed highest fruit length (11.33cm) followed by fruits covered black polythene (10.23cm). The fruit covered with transparent polythene showed highest fruit girth (13.30cm) followed by fruits covered black polythene (13.10cm). The beneficial effect of bunch cover increase in finger length over control was

reported [1, 2, 3 & 4] also reported increase in fruit length of Banana in covered bunches.

The colour of bunch cover significantly influenced the fruit weight (Table 4.1). The highest fruit weight (g) and (105.33g) were recorded in bunches covered by transparent polythene cover in year respectively and the lowest was observed in control. These results do agree with the finding of also found significant increase in fruit girth in covered bunches against control the fruit diameter and fruit size was increased [4, 5, 6]. The bunches covered by transparent polythene recorded highest bunch weight (7.68kg) followed by black polythene (7.32kg) which were at par with each other. The increased fruit of the covered banana bunches were also observed [7, 5, 4].

Days taken to maturity was less than control and it ranged from 125.67 to 134.00 days. Treatment with transparent polythene cover showed results which were (125.67 days respectively for the years). Similar findings were reported [7] in banana cv. Robusta. Reported that bunch covers reduced the time from bunch 43 the document or the emergence to harvest by 5-11 days [2]. Also reported that transparent polythene cover reduced the interval by 15 days compared to uncovered bunches [3].

The green life of the fruits varied narrowly from 10.00 to 11.33 in the season. Highest red life (6 days) was found in transparent polythene treatment in the season and the least being with black polythene (5.00 days each) and control (4.00 days). Also found that there is no significant difference in green life of treated and untreated ones as bunches covered with polythene sleeves would be more matured causing reduction in green life [8].

The results were found significant. The pulp to peel ratio ranged from 1.65 to 2.12. The highest pulp peel ratio was observed in transparent polythene cover 2.12 for the season respectively which was followed by black polythene 1.99. Increase in pulp weight in covered bunches when compared with control was also observed [6]**.** Highest PLW was recorded in the bunch covered by Black polythene cover (13.37) followed by transparent polythene cover (12.49%). These results are in contradictory to the findings in banana cv. Basrai [9]. The treatment Transparent polythene covered fruits showed highest TSS (14.38 oBrix) followed by black polythene covered fruits (14.31 oBrix) in the season. The increase in TSS in bunch covered fruits was also reported [9, 8, 10 & 6]**.** However, did not observe any significant difference between the bagged and unbagged bunches [4]. There was non significant difference between covered banana bunches and uncovered bunches in acidity. Highest titrable acidity (0.32) was obtained in control which was at par with other transparent polythene (0.32) blue colour (0.32), red (0.31), white non transparent polythene (0.31), black polythene (0.31) in the season. However the reducing sugar were higher in transparent polythene (11.52) and minimum reducing sugar (9.31) was observed in control. The non reducing sugar was higher in transparent polythene (3.45) and minimum reducing sugar (2.52) was observed in control. The total sugar were higher in transparent polythene (14.94) and minimum reducing sugar (11.83) was observed in control. An increased total sugar in the polythene cover treated fruits was also reported [10 & 4]**.** Among the bunch covered fruits, transparent polythene covered fruits scored excellent (5.0) for skin colour followed by blue polythene (4.67) and red polythene (4.33). Flavour were also high in bunches covered by transparent polythene in season scoring excellent (4.67 for flavour). Texture were also high in bunches covered by transparent polythene in the season scoring excellent (2.83 for flavour). Taste were also high in bunches covered by transparent polythene in the season scoring excellent (4.83 for taste). Among the treatments, transparent covers scored the highest score for skin overall acceptability (4.67) in the season.

Table 1: Effect of different bunch covers on fruit length, fruit girth, fruit weight, Bunch weight (kg), Days to taken maturity (Days), Green life (Days), Red life (Days) Pulp-Peel Ratio and PLW of Red Banana.

Type of Bunch covers	Fruit length (cm)	Fruit girth (cm)	Fruit weight (g)	Bunch Weight (kg)	Days to Taken Maturity	Green Life (Days)	Red life (Days)	Pulp – Peel Ratio	PLW
T_1	9.73	12.70	98.33	7.17	129.33	10.67	4.33	1.70	10.45
T_2	10.07	12.60	96.00	6.92	131.67	10.33	5.00	1.73	9.37
T_3	9.00	12.17	93.33	6.87	127.33	11.00	5.00	1.65	7.07
T_4	11.33	13.30	105.33	7.68	125.67	11.33	6.00	2.12	12.49
T_5	10.23	13.10	101.33	7.32	134.00	11.00	5.00	1.99	13.37
T_6	9.30	12.60	94.67	6.82	133.33	10.00	4.00	1.72	7.87
S.Ed.	0.26	0.24	2.31	0.20	2.71	0.64	0.94	0.22	0.71
C. D.	0.55	0.51	4.79	0.42	5.61	1.32	1.95	0.45	1.46
F-test	**S**	**S**	**S**	**S**	**S**	**NS**	**NS**	**NS**	**S**

Table 2: Effect of different bunch covers on TSS, Acidity, Reducing sugar, Non-reducing sugar, Total Sugar, Color, Flavour, Texture, Taste and Overall acceptability of Red Banana.

Type of Bunch covers	TSS	Acidity	Reducing Sugar	Non Reducing Sugar	Total Sugar	Colour	Flavour	Texture	Taste	Overall acceptability
T_1	13.17	0.32	10.41	2.52	13.16	4.67	4.33	2.87	4.33	3.83
T_2	13.52	0.31	11.22	2.67	13.78	4.33	4.33	2.67	4.67	3.33
T_3	12.61	0.31	9.31	2.56	12.59	4.00	3.33	3.63	4.17	3.17
T_4	14.38	0.32	11.52	3.45	14.94	5.00	4.67	2.83	4.83	4.67
T_5	14.31	0.31	11.49	2.88	14.39	3.33	3.67	3.17	3.50	3.17
T_6	12.56	0.32	9.92	2.52	11.83	3.33	3.67	3.70	4.33	3.33
S.Ed.	0.53	0.01	0.37	0.19	0.38	0.59	0.47	0.36	0.31	0.34
C. D.	1.10	0.03	0.77	0.40	0.79	1.23	0.98	0.75	0.64	0.71
F-test	**S**	**NS**	**S**	**S**	**S**	**S**	**NS**	**S**	**S**	**NS**

Conclusion: In the present investigation concluded that among the different treatment combinations the treatment T_4 (bunch cover with transparent polythene) was superior in respect to fruit growth, yield and quality parameters. The treatment was also recorded best as for as shelf life is concern.

References

1. Robinson, J.C. and Nel, D.J. (1984). Banana bunch covers effective in winter. Information Bulletin – Citrus and Subtropical Fruit Research Institute, 138: 5-6.
2. Daniells, J.W., Lisle, A. T. and Farrel, P.J. (1992). Effects of bunch covering methods on maturity bronzing, yield and fruit quality of bananas in North Queensland. *Australian J. Expt. Agric*.,32(1): 121-125.
3. Debnath, U., Suresh, C.P. and Hasan, M.A. (2001). Bunch management for profitable production in winter developing banana bunches. *Indian.J.Hort*.,58 (3).57-61.
4. Weerasinghe, S.S.and Rawanpathirana, K.H. (2002). Influence of bagging material on bunch development of banana (*Musa* spp.) under high density planting system. *Annals of the Sri Lanka Department of Agriculture*, 4. 47-53.
5. Chillet, M., and Jananoyee, M. (1996). Choice of bagging for the optionization of banana growth condition. *Info musa*, 5(1), 25-27.
6. Hasan, M.A., Chowdhury,R., Sarkar, S., Mandal, K., Suresh, C.P., Majumder, D and Mathew, S. (2007). Effect of bunch covers on yield and finger quality of banana cv. Grande Nain. In National Conference on Banana held during October 25-28 in Tiruchirapallly. T.N. pp.130.
7. Reddy, S.A. (1989). Effect of bunch covers on bunch maturity and fruit size in high density Robusta orchards. *J.Res*.(APAU), 17(1): 81-82.
8. Mary, A. E. and Sathiamoorthy, S. (2002). Effect of preharvest treatments on green life and quality of banana cv. Sanna Chenkadali (AA). South Indian Horticulture; 2002. 50(1/3):182-184.
9. Parmar, B.R. and Chundawat, B.S. (1984). Effect of growth regulators and sleeving on maturity and quality of banana cv. Basrai. *South Indian Hort*., 32: 201-204.
10. Choudhury B.K., Kim J., Kung H.F., Li S.S. (1997). Cloning and developmental expression of Xenopus cDNAs encoding the Enhancer of split groucho and related proteins. *Gene* 195*:*41–4