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# Postharvest Management in Agriculture

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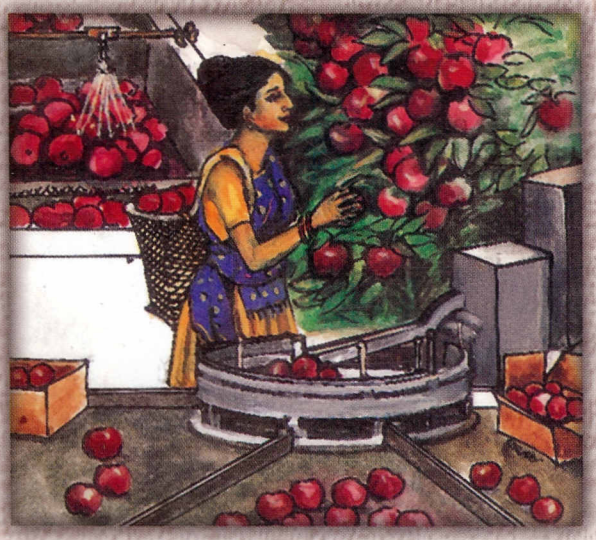

## SAARC Agricultural Information Centre

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# CONTENTS

ded paper, paper lining or egg trays as cushioning materials. Cardboard boxes with egg trays were best; they gave minimum weight and decay losses. The quality parameters such as TSS, acidity and ascorbic acid were also maintained, and fruits were marketable even after 6 days of storage.

**688** SHARMA, RK; SANDOOJA, JK; SINGHROT, RS; SINGH, JP. 1986. **Studies on the shelf life of peach cv. Flordasun as affected by various packing materials**. *Haryana Journal of Horticultural Sciences*, 15: 3/4, 188-195; 5 ref.

Fully ripened fruits were held in wooden boxes or bamboo baskets (lined with dried grass or paper) or in egg-trays packed into cardboard boxes. The least weight loss and decay, and the best fruit quality were obtained with egg-trays.

**689** SHARMA, RL. 1994. **Efficacy of post-harvest fungicidal treatments on brown rot of peach**. *Indian Journal of Mycology and Plant Pathology*, 24: 1, 60-61.

**690** SINGH, RS; PRASHAR, M. 1989. **Post-harvest spoilage of peach and plum fruits in north India due to *Aspergillus***. *Journal of Research, Punjab Agricultural University*, 26: 1, 62-64; 9 ref.

Infected peaches and plums were collected from a market in Ludhiana, Punjab, India. The pathogens were isolated, purified and identified. Pathogenicity was confirmed by using the pin-prick method on injured and uninjured fruits. Fungi associated with fruit rot were identified as *A. flavus*, *A. fumigatus*, *A. japanicus* [*A. japonicus*], *A. niger* and *A. terreus*.

**691** SINGH, RS; PRASHAR, M. 1984. **Studies on *Rhizopus* rot of peach and its control**. *Indian Journal of Mycology and Plant Pathology*, 14: 2, 185-187; 4 ref.

*R. stolonifer* caused losses in peach fruits during storage and transit in Ludhiana. Fruit rot developed at 20 and 25°C, with no infection at 10 or 35°. Rot progressed rapidly at RH 80% and above. The best control was given by actidione followed by boric acid.

**692** SUMBALI, GEETA; MEHROTRA, RS. 1982. **Post-infectional changes in the ascorbic acid content of some stored pome and stone fruits**. *Indian Journal of Mycology and Plant Pathology*, 12: 2, 247-248; 7 ref.

Ascorbic acid content declined gradually in healthy fruits and more rapidly in infected fruits. The content in peach fruits fell from 20.8 mg/100 g fresh wt to 2 mg after 10 d of pathogenesis by *Aspergillus niger*, compared with a loss of only 24% in similarly stored healthy tissues. In pears infected by *Sclerotium rolfsii* and apples by *Gliocladium roseum* the reduction was very rapid, with complete depletion after 8 and 10 d, respectively. The loss in storage of noninfeced pear and apple fruits was 32 and 43%, respectively. The possible reasons for the decline are discussed.

# PLUMS

## Storage and storage decay

**693** BADYAL, K; SUMBALI, G. 1990. **New fruit rot of plum from India**. *Indian Journal of Mycology and Plant Pathology*, 20: 1, 78.

Plums in the local fruit market in Jammu were affected by *Aspergillus niger*, causing circular, brown, water-soaked lesions on the fruit surface. Pathogenicity was confirmed by pin-prick inoculation.

**694** BAL, JS; BINDRA, AS; BAJWA, GS; MINHAS, PPS. 1990. **Studies on harvesting and handling of plum**. *Acta Horticulturae*, No. 283, 179-188.

Physical and chemical changes during ripening of cultivars Kala Amritsar and Titron were followed in order to find the optimum time for harvesting and subsequent storage. Fruit weight and breadth increased until maturity. Fruits with a specific gravity of $<1$ were considered ripe and it is suggested that this could be a useful indicator of maturity. TSS increased continuously and the increase was most rapid from 8 weeks after fruit set until maturity; this corresponded with a decrease in acidity. Vitamin C concentration in Kala Amritsar increased up to week 10 then declined slowly. It is suggested that fruits of the cultivar Triton should be picked in the last week in May for local consumption and 1 week earlier for more distant markets. Fruits of Kala Amritsar, picked when ripe and pretreated with a 3-6% wax emulsion, could be stored at room temperature for 4 days in paper bags. Fruits pretreated with a 3-6% wax emulsion for 30 s and placed in perforated polyethylene bags (100 gauge) could be stored for up to 40 days in a cold store (30-35°F, 85-90% RH).

**695** BHUTTANI, VP; JOSHI, VK. 1994. **Plum**. *Handbook of World Fruits; Cultivation, Storage and Processing*/edited by DK Salunkhe; SS Kadam. USA: Marcel Deckers.

**696** CHOPRA, SK; MISRA, SS; BHUTANI, VP; KASHYAP, AS. 1986. **Effect of nutrients, growth**

**regulators and fungicides on the storage behaviour of Santa Rosa plum (*Prunus salicina Lindl.*).** *Advances in research on temperate fruits. Proceedings of the national symposium on temperate fruits.* (1984: 15-18 March: Himachal Pradesh Agricultural University, Solan, India). Solan, India: Dr. Y.S. Parmar University of Horticulture and Forestry, p. 327-334; 7 ref.

Twenty postharvest treatments were compared. Fruits dipped in 4% CaCl2 for 2 minutes showed the highest colour development and lowest firmness loss when held at 21-26.7°C. Highest TSS, reducing sugar and non-reducing sugar contents after 12 days' holding were (respectively) recorded after treatment with 4% CaCl2, 2% H3BO3 + 100 p.p.m. kinetin, and 2% H3BO3 + 1000 p.p.m. Bavistin [carbendazim]. Contents of titratable acids, ascorbic acid, total phenolics and soluble protein declined during holding, but the reductions were least (respectively) following treatments with 4% CaCl, 2% H3BO3 + 1000 p.p.m. CCC [chlormequat], 4% CaCl2 + 100 p.p.m. kinetin, and 2% H3BO3 + 1000 p.p.m. Bavistin. The storage life of the fruits was 12 days following all treatments except the water control and the H3BO3 treatment, where it was 8 days.

**697** GOEL, SANJAY KUMAR. 1989. **Effect of different packages on the quality of plum during transportation and storage (M.Sc: thesis).** Dr. Y.S. Parmar Uni. of Agriculture and Forestry, Solan. 87p.

Santa rosa plum fruits harvested at optimum maturity, packed in different type of packagings were transported and stored in cold storage at 2°+1° C for 28 days. There was a loss in fruit firmness in all types of containers during transportation and storage. Total sugars and reducing sugars observed increase during storage. Smaller sized cartons/boxes, in general, recorded faster physico-chemical changes and higher values for fruit damage than the larger ones. Plastic cartons were found better substitute of conventional wooden boxes. CFB cartons could also be used for packing and transport of plum, if these were handled properly and protected from direct rains. The conventional size of cartons was found better than the smaller ones. Pre-cooling of the fruit was found to retain better quality during transportation, storage and marketing. For retaining optimum fruit quality during transport and marketing, pre-cooling should be followed by transportation to terminal markets of cold stores in refrigerated vans.

**698** NASIB SINGH. 1989. **Market structure and marketing problems of plum and apricot in Himachal Pradesh (M.Sc thesis).** Dr. YS Parmar Univ. of Horticulture and Forestry, Solan. 102 p.

The present study was conducted in Solan and Sirmour districts. Three stage sampling design was adopted to select the ultimate respondents. The primary data from the sample orchardists, traders, and the secondary data from Directorate of Horticulture, Himachal Pradesh and respective market committees of selected markets were collected. The Delhi market was highly correlated with all other markets in regard to apricot. In case of plum, Delhi market was positively correlated with other markets under study. Correlation between Karnal and Ambala markets was negative due to low value of arrivals. The trend values for plum in Shimla and Ambala markets were higher than karnal and Delhi markets. whereas, in case of apricot, Delhi and Karnal showed higher trend values as compared to shimla and Ambala market. Ambala and Karnal markets for plum and delhi and Karnal for apricot were found to be suitable markets on the basis of high ratio of average price and coefficient of variation. Orchardists had been facing number of marketing problems such as problems of packing material, grading and packing, storage, transportation, problem of market intelligence and of malpractices.

**699** SAIKIA, UN; PUZARI, KC. 1982. **Fruit rot of plum - a new post-harvest disease.** *Indian Phytopathology*, 35: 2, 334; 5 ref.

*Geotrichum candidum* was identified as the cause of this previously unreported rot and its pathogenicity confirmed.

**700** SINGH, SN; MANGAT, HS; BAL, JS; BINDRA, AS. 1990. **Biochemical changes during ripening of plum (*Prunus salicina Lindl.*).** *Acta Horticulturae*, No. 283, 173-178.

Fruits of the cultivars Kala Amritsar and Kataru Chak were sampled 73 days after fruit set and subsequently at 7-day intervals until fruit maturity. TSS increased continuously; this was concomitant with a continuous decrease in starch levels. The only sugars found were sucrose, glucose and fructose which increased to levels of 3.1, 5.2 and 1.1% in Kala Amritsar (at 94 days) and 3.4, 4.8 and 1.1% in Kataru Chak (at 87 days), respectively. Total phenolics concentration decreased steadily and was lowest at fruit maturity. Anthocyanins increased until fruits were ripe. On the basis of these studies, it is suggested that Kala Amritsar should be harvested at 94 days after fruit set and Kataru Chak at 87 days.

**701** VIJAY, S; MAINI, SB; CHANDHA, VP; BHUTANI, JL. 1986. **Quality of plum syrup in different containers during storage.** *National Sympo-*

*sium on Temperate Fruits*. Dr. Yashwant Singh Parmar University, Department of Horticulture and Forestry, Solan. p. 345-347.

## *PRUNUS DOMESTICA (Alubukhara)*

**702** KRISHNAIAH, J; SATYAPRASAD, C; GIRIDHAR SINGH, T; THIRUPATHAIAH, V; DAVE, BHALCHANDRA. 1985. **Decco food grade fruit coatings for control of post harvest decay of alu-bukhara fruits**. *Indian Journal of Mycology and Plant Pathology*, 15: 3, 274-278; 6 ref.

Post harvest applications of these coatings containing the fungicide orthophenylphenol as the active ingredient controlled rots in these *Prunus domestica* [plum] fruits caused by *Aspergillus niger*, *Geotrichum candidum*, *Monilinia fructicola*, *Rhizopus stolonifer*, *Trichoderma* and *Penicillium digitatum*.

**703** KRISHNAIAH, J; THIRUPATHAIAH, V. 1990. **Effect of environment on post-harvest fruit rot of *alubukhara* caused by fungi**. *Acta Botanica Indica*, 18: 1, 95-96.

Infection of stored plums by *Aspergillus niger*, *Monilinia fructicola* and *Trichoderma viride* was most severe at high temp. (32°C) and RH (90-100%).

## CHERRIES

**704** BADYAL, KUSUM; SUMBALI, GEETA. 1990. ***Aspergillus* rot of cherry fruit**. *Indian Journal of Mycology and Plant Pathology*, 20: 3, 280.

*A. fumigatus*, *A. versicolor*, *A. terreus*, *A. niger* and *A. flavus* were isolated from dark brown, flat spots on the surface of cherries in local fruit markets in Jammu. Pathogenicity was confirmed experimentally.

**705** DAIVASIKAMANI, S; KANNAN, N. 1986. **Studies on post-harvest mycoflora of coffee cherry of *Robusta***. *Jrl. of Coffee Res.*, 16: 3-4, 102-106.

Incidence of *A. niger*, *A. ochraceus*, *Cladosporium sp. Mucor sp.*, *Pencillium*, *Trichoderma sp.*, a pink yeast and actinomycetes following incubation for 2-9 d is tabulated. These are associated with drying cherries are involved in coffee quality deterioration.

## *LITCHI CHINENSIS*

### Cracking

**706** KANWAR, JS; NIJJAR, GS. 1984. **Comparative evaluation of fruit-growth in relation to cracking of fruits in some litchi cultivars**. *Punjab Horticultural Journal*, 24: 1/4, 79-82.

Fruit growth pattern in the cultivars Dehra Dun (highly susceptible to cracking), Calcuttia (moderately) and Hong Kong (resistant) was examined over 2 years. Diametrical fruit growth had a grea-ter effect on cracking than longitudinal growth. A higher fruit diametrical growth rate from mid-May to early June, when the temperature was high and RH low, made Dehra Dun more susceptible to cracking than Calcuttia or Hong Kong, in which diametrical growth rates were much lower during this period. Effect of NAA, GA and 2,4,5-T on preventing fruit cracking was not appreciable, with NAA at 15 p.p.m. having the best effect.

**707** SHARMA, SB; RAY, PK. 1987. **Fruit cracking in litchi - a review**. *Haryana Journal of Horticultural Sciences*, 16: 1 & 2, 11-15; 27 ref.

The factors considered were cracking stage and pattern, varietal susceptibility to cracking, temperature and humidity, anatomical factors, irrigation and rainfall, physiological factors, chemical composition of the fruit, control measures, supply of nutrients, use of growth regulators, and breeding of crack resistant cultivars.

### Ripening

**708** AJAY SINGH; ABIDI, AB. 1986. **Studies on the variation in protein, amino-acids and ash content of different litchi (*Litchi chinensis Sonn.*) cultivars during ripening and post-harvest storage**. *Narendra Deva Journal of Agricultural Research*, 1: 2, 149-154; 14 ref.

Variations in protein, tryptophan, methionine and ash contents in the cultivars Early Large Red, Calcuttia, Muzaffarpur and Bedana were studied on different harvesting dates and during storage. Fruit samples were taken after 80, 87, 94 and 101 days from fruit set. At ripening the fruits were harvested, packed in polyethylene bags and stored at ambient temperature. Protein, tryptophan and ash contents increased continuously, whereas methionine content decreased in the beginning and thereafter increased slightly as ripening approached. A reverse trend was noticed in protein, tryptophan and ash contents during storage. Methionine content did not show any definite trend throughout the storage period.

**709** NAGAR, PK. 1994. **Physiological and biochemical studies during fruit ripening in litchi (*Litchi chinensis Sonn.*)**. *Postharvest Biology and Technology (Netherlands)*, 4: 3, 225-234.