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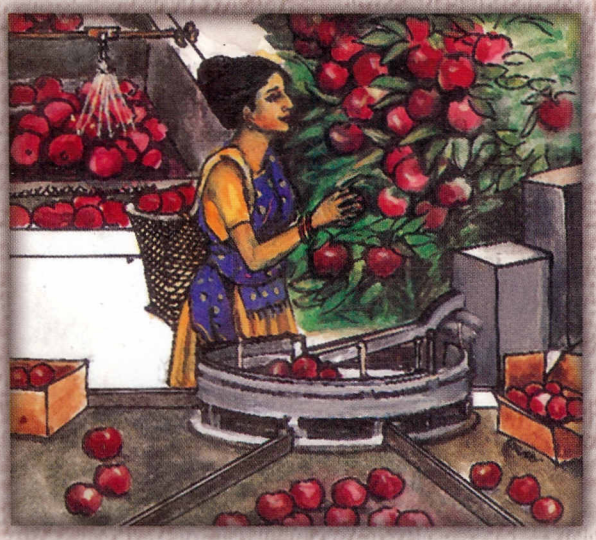

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Postharvest Management in Agriculture
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SAARC Agricultural Information Centre (SAIC)
BARC Complex, Farmgate, Dhaka 1215, Bangladesh

Published : 1995

Cover design : Mafruha Begum

Price : US$ 5.00 for SAARC countries
US$ 8.00 for other countries

Chandel, A S and Kamal, R M
Postharvest Management in Agriculture: SAARC bibliographical database.
Dhaka: SAARC Agricultural Information Centre, 1995.
ii, 231, xxxv p.
1. Postharvest technology, bibliography. 2. SAARC Agricultural Information Centre. i. Jt. Author. ii. Title.

Published by : Director, SAARC Agricultural Information Centre (SAIC)
Printed at : Panir Printers, 9 Nilkhet, Dhaka 1205

CONTENTS

cooling with cold water. The quality in terms of TSS, acidity and ascorbic acid was retained for longer periods. These treatments also reduced the ethylene production.

961 SINGH, JP; GUPTA, OP. 1983. **Evaluation of various packings of *ber* fruit in relation to decay loss caused by various microbes**. *Haryana Agricultural Univ. Jrl. of Res.*, 13: 4, 593-595.

Four types of packaging and 2 cushioning materials were evaluated for their effect on microbial decay during storage of Umran and Kaithli cultivars of *ber* (*Ziziphus mauritiana*) at room temp. Gunny bags and wooden boxes were better at reducing spoilage than packing made of bamboo basket or cardboard. Paper cuttings were the best cushioning material for reduction of decay losses due to *Ulocladium chartarum*, *Phoma hissarensis* and *Botryodiplodia theobromae*.

962 ULLASA, BA; RAWAL, RD. 1986. **Some new post-harvest diseases of *ber* (*Zizyphus mauritiana L.*) from Karnataka**. *Indian Journal of Plant Pathology*, 4: 2, 162-164; 9 ref.

Post harvest decay caused by *Phytophthora nicotianae*, *Sclerotium rolfsii* and *Botryodiplodia theobromae* is described.

GRAPES

Postharvest handling

963 ANAND, JC. 1985. **Postharvest management of Indian grapes**. *Maharashtra Journal of Horticulture*, 2: 1, 1-13; 21 ref.

A review and discussion on: area and production, maturity, harvesting, packing and containers, fumigation, storage, transportation, marketing, processing, and research and development.

964 CHADHA, KL. 1984. **Grape research in India - priorities and suggested approach for future**. *Indian Jrl. of Hort.*, 41: 3/4, 145-159; 32 ref.

A review and dicussion under the following headings: grape improvement; propagation and rootstocks; training; pruning; nutrition; fertilizer use efficiency; water management; diseases, insect pests and nematodes; post harvest technology; and specific problems (flower and flower bud drop, cluster tip wilting, pink berry formation, poor bud burst, premature defoliation, poor cane maturity, and dead arm and trunk splitting).

965 MAINI, SB; ARVE, SD; SAGAR, VR; RAJESH, K. 1994. **Effect of pre-treatment on the quality of dehydrated grapes**. *Drakshavritta Souvenir*, 14: 6, 179-180.

966 MAINI, SB. 1985. **Precooling of grapes by evaporative cooling system**. *Proc. Nat. Work. on Postharvest Management of Grapes*. (Pune: 1985: 4-6 Feb). Division of Fruit & Hort. Technology, IARI, New Delhi. p. 113-116.

967 RAVI KUMAR; CHAUHAN, KS; SUNEEL SHARMA. 1988. **A note on the effect of zinc sulphate on berry set, panicle drying and quality of grapes cv. Gold**. *Haryana Journal of Horticultural Sciences*, 17: 3-4, 213-215; 3 ref.

In trials with 15-year-old vines trained on the Kniffin system, ZnSO4 at 0.2, 0.3 or 0.4% was sprayed at full bloom. The highest berry set (45.1%), the least panicle drying (31.98%) and the best grape quality were obtained with $ZnSO_4$ at 0.2%. In the control, berry set was 35.76% and panicle drying was 59.2%

968 ROY, SK. 1985. **Development of packing for export of grapes**. *Proceedings of First National Worksh-op on Post-Harvest Management of grapes*. (Pune: 1985: 4-6 Feb). Division of Fruit & Hort. Technology, IARI, New Delhi.

969 SHANKARIAH, V; ROY, SK; PAL, RK. 1992. **Post harvest handling of grapes**. *Acta. Hort.*

970 SHARMA, KD; SHARMA, PC; THAKUR, KS. 1993. **Evaluation of some grape cultivar for processing growth under dry climatic condition of Himachal Pradesh**. *Indian Fd. Packer*, 47: 5, 5-8.

971 VIRENDER, SINGH. 1991. **Production and marketing of grapes (*Vitis vinifera L.*) in Hisar District of Haryana (M.Sc: thesis)**. CCS Haryana Agricultural University, Hisar.

The requisite data for the present study were collected from 72 grape growers selected randomly from three selected blocks of Hisar district as well as other related agencies. The study revealed that grape growers incurred losses during the initial three years of installation of grape orchard. The profit earned increased from fourth (Rs. 187.17) to seventh year (Rs. 27767.05) and thereafter it became almost stagnant throughout the expected life of 30 years. The net present value calculated at 13% discount rate for one hectare came to be Rs. 61734.53 for the entire expected life. Further, on the

basis of benefit cost rate and internal rate of return it may be concluded that grape orchard is a profitable proposition. It was observed that most of the grape was marketed through direct sale followed by contract sale. The net price received by producer was also found higher in case of direct sale as compared to contract sale in Hisar market which accounted for 44.21 and 26.04 per cent of the consumer's rupee, respectively. The lack of fair prices mainly due to seasonal glut, lack of cold storage/processing facility, delay in payment and lack of adequate number of buyers in the market were the major problems faced by the orchardists in selling their produce.

Storage

972 KUMAR, J; SHARMA, RK; YAMDAGNI, R. 1987. **Shelf-life of grapes: effect of storage conditions and antifungal fumigants**. *Haryana Agricultural University Journal of Research*, 17: 4, 379-384; 6 ref.

Fruits of the cv. Perlette in paper-lined ventilated boxes were stored in zero energy chambers, modified atmosphere, room temperature or unmodified conditions, with and without diphenyl (at 500 mg/kg fruit), which was applied to the paper lining. Fruits stored in zero energy chambers showed the least weight loss and decay [cause unspecified]. Diphenyl was also effective in checking weight and decay losses. Data are also tabulated on the effect of storage conditions on grape chemical composition.

973 KUMAR, RANJIT; GUPTA, OP. 1987. **Effect of pre-harvest application of fungicide, growth regulators and calcium nitrate on the storage behaviour of Perlette grapes at low temperature**. *Haryana Agricultural University Journal of Research*, 17: 1, 30-38; 21 ref.

Pre-treatments of Benlate [benomyl], growth regulators and calcium nitrate reduced the loss in wt, berry drop and berry rot in Perlette grapes. The highest reduction in total spoilage was observed with naphthalene acetic acid (NAA) (150 p.p.m.) followed by NAA (100 p.p.m.), calcium nitrate (0.75%) and gibberellic acid (GA) (50 p.p.m.). Total spoilage increased during prolonged storage. All treatments reduced the respiration rate in grapes but a marked reduction was found with NAA (100 and 150 p.p.m.), GA (50 p.p.m.) and calcium nitrate (0.75%) applications. The respiration rate was decreased during the initial days of storage but later increased.

974 KUMAR, S; CHHARIA, AS. 1990. **Effect of different growth substances and pre-packaging on storage life of grapes cv. Perlette**. *Haryana Journal of Horticultural Sciences*, 19: 1-2, 122-128; 9 ref.

At the berry set stage, bunches of fruit were dipped in aqueous solutions of GA3 at 10, 25 or 50 p.p.m., kinetin at 50, 100 or 150 p.p.m. or CCC [chlormequat] at 3000, 4000 or 5000 p.p.m. After harvest the bunches, packed in perforated polyethylene bags at 2 bunches/bag, were stored at room temperature (93.2 ± 2°F) and 40-50% RH for up to 6 days. After treatment with CCC at 5000 p.p.m., GA3 at 10 or 25 p.p.m. or kinetin at 150 p.p.m. the grapes were marketable for up to 4 days after storage compared with only 2 days in the untreated control.

975 LADANIA, MS; DHILLON, BS. 1989. **Effects of packaging and in-package SO_2 generators on shelf life of Perlette grapes at ambient and refrigerated conditions**. *Journal of Food Science and Technology Mysore*, 26: 1, 4-7; 14 ref.

The storage life of Perlette grapes was extended up to 80 days in refrigerated conditions (1 ± 1°C) compared with 6 days in ambient conditions (34 ± 5°). Quick release (QR) and dual release (DR) SO_2 generators were used in combination with various packaging systems. A vented polyethylene-lined corrugated fibre board (CFB) carton (2 kg) equipped with a quarter size DR SO_2 generator gave excellent results under refrigerated conditions. A QR type combined with vented polyliner effectively controlled water loss, browning and decay which occurred in ambient conditions. Newsprint lining resulted in maximum losses. The CFB cartons were handy and provided better aeration to the fruits with the result that overall losses were less in the containers. However, these cartons needed more stacking strength to withstand pressure when covered. Negligible bleaching was observed in grapes packed with QR and DR SO_2 generators.

976 LADANIA, MS; DHILLON, BS. 1987. **Studies on long term storage of Beauty Seedless grapes**. *Indian Journal of Hort.*, 44: 1/2, 34-40; 15 ref.

Storage life was prolonged up to 80 days under refrigerated conditions. CFB (corrugated fibre board) cartons lined with perforated polyethylene and equipped with quarter-size dual release SO_2 generators gave excellent storage life. Fruit appearance and eating quality were fairly good. Grapes stored in CFB cartons lined with newspaper or unperforated polyethylene had more berry

shatter and decay than when SO_2 treatment + perforated polytheylene liners were used. Bleaching was considerably less in perforated-polyethylene-lined cartons; however, weight loss was slightly more in these packs. In general, soluble solids and acidity increased during storage, with packaging and SO_2 treatment having negligible influence on these parameters. The total residual SO_2 in the berries with slight bleaching near the capstem end was about 25 p.p.m. The half-bleached berries had nearly 100 p.p.m. residual SO_2.

977 LADINIYA, MS; DEY, SK; BHULLAR, JS. 1990. **Growth retardants in controlling storage rots of grapes**. *Pesticides Bombay*, 24: 1, 27-28, 31; 12 ref.

CCC [chlormequat] at 2000 p.p.m., applied at the second rapid growth stage of berry development, controlled storage rot of cv. Perlette, associated with *Aspergillus niger, A. flavus*, *Penicillium sp.* and *Botrytis cinerea*. Applications of chlormequat or Alar [daminozide] at 4000 p.p.m. at the pre-bloom stage were also effective.

978 PILLANIA, SUKHBIR. 1989. **Studies in transportation and storage behaviour of grapes (*Vitis vinifera L.*) cv. *Perlette* (Ph.D : thesis)**. Haryana Agricultural University, Hisar.

The studies were conducted to see the effect of girdling and pre-harvest application of fungicides on grape storage and to evaluate packaging and cushioning material for grape transportation. Pre-harvest application of fungicides reduced the loss in weight and berry rotting during storage. Weight loss and berry rotting increased with increase in storage period. Respiration rate of grape berries decreased with the application of fungicides. Total soluble solids, reducing sugars, total sugars, acidity and total phenols content increased storage. Free amino acids, ascorbic and organoleptic quality decreased with increase in storage period. Among the fungicidal treatments, dithane Z-78 at 0.2% was found the best, followed by dithane M-45. the fungicide treated grapes were organoleptically acceptable upto 9 days of storage. various girdling treatments increased total soluble solids, total and reducing sugars, ascorbic acid and total phenols content of grape berries. acidity, respiration and free amino acids content were found less in the grape berries harvested from girdled vines. During storage, girdling treatment reduced the loss in weight and berry rotting. Total soluble solids reducing and total sugars, acidity, total phenols content of grape berries increased during storage, while respiration, free amino acids and organoleptic quality of grape berries decreased. The grape transported in wooden boxes had reached destination in good physical condition and was evaluated good organoleptically. The grape berries packed with various cushioning materials were found sound and healthy and sustained less physical injury due to compression and depression. The loss in weight and berry decay percentage were less in grape berries packed with neem leaves as cushioning material. Total soluble solids, acidity reducing and total sugars and total phenols content increased, while respiration rate, ascorbic acid, free amino acids and organoleptic quality decreased during transportation.

979 RANJIT KUMAR; SINGH, SP; CHHARIA, AS. 1990. **Effect of pre-harvest application of different chemicals on the quality of grapes cv. Delight during storage**. *Haryana Journal of Horticultural Sciences*, 19: 1-2, 62-70; 16 ref.

Twelve-year-old vines, trained on the Bower system, were sprayed 10 days before harvest with Cycocel [chlormequat] at 250-1000 p.p.m., 1% Ca(NO3)2, 0.2% ZnSO 4 or 1% Ca(NO3)2 + 0.2% ZnSO4. After harvest, the bunches were packed in polyethylene bags and stored at room temperature (34 ± 4°C) and 40-50% RH for up to 6 days or at O ± 1° and 80-85% RH for up to 24 days. Data are tabulated on grape TSS %, acidity, ascorbic acid, organoleptic rating, and Ca content. The organoleptic rating and grape quality in both types of storage were highest after treatment with 1000 p.p.m. Cycocel or 1% Ca(NO3)2.

980 RATHEE, AS. 1983. **Studies on the effect of different fungicides and calcium salts on the post-harvest storage life of grapes (*Vitis vinifera L.*) cultivars Beauty Seedless and Thompson Seedless**. *Thesis Abstracts, Haryana Agri. Uni.*, 9: 4, 338-339.

Three calcium salts or 3 fungicides were applied to the bunches 10 days before harvest and the grapes were stored in perforated polyethylene bags at 93.2 or 32°F [duration unspecified]. The maximum increase in storage life (8 days) over the control was obtained in cold storage with Beauty Seedless treated with 1.5% calcium nitrate and with Thompson Seedless treated with 0.15% captan or 0.2% Difolatan [captafol]. At room temperature the maximum increase in storage life for both cultivars was 2 days. The storage life of Thompson Seedless grapes was longer than that of the other cv. The treatments had no adverse effects on grape quality.

981 ROY, SK; PAL, RK; SHANKARIAH, V; GUITE, N. 1992. **Temperature management during handling and storage of fresh and processed grapes**. *Acta. Hort.*

982 SANDHU, SS; RANDHAWA, JS. 1992. **Economics of cold storage of grapes**. *International Symposium on Tropical Fruit: Frontier in Tropical Fruit Research*. (Pattaya City (Thailand): 1991: 20-24 May)/- edited by S Subhadrabandhu. Wageningen: International Society for Horticultural Science, p. 821-824.

983 SANDHU, SS; DHILLON, PS; BINDRA, AS. 1990. **Effects of package and storage conditions on the keeping quality of Perlette grapes**. *Vitis*, 29: 2, 97-107; 13 ref.

To reduce postharvest losses of cv. Perlette grapes, quarter size 'Dual Release' SO_2 generators were enclosed in polyethylene bags (containing 2 kg grapes) having 0.56, 0.84, 1.12, 1.40 or 1.68% perforation. These bags were packed in 2-kg vented corrugated fibreboard cartons at 5, 15, 25, 30 or 35°C (field temperature) and were kept for 60 days in cold storage. The highest organoleptic score was observed at 35° packing temperature and 1.12% perforation in the polyliner. Both the lowest packing temperature (5°) and least perforation in the polyliner (0.56%) minimized the physiological loss in weight (PLW) and berry shatter. PLW increased with prolonged storage period. There was no berry rot with up to 40 days of storage with 0.56, 0.84 and 1.12% perforation; rot however, was negligible with the higher percentages of perforation. The highest values of total soluble solids (TSS) were retained at 30 or 35° packing temperature after 40 days of storage; thereafter TSS declined. However, highest acidity was recorded at 25 and 35° after 40 days and at 15 and 30° after 60 days of storage. Thus, in cold storage, Perlette grapes can be successfully stored for up to 40 days by enclosing quarter size 'Dual Release' SO_2 generators in polyliners having 1.12% perforation and packing at 35°.

984 SHARMA, RK; RAN SINGH; KUMAR, J; SHARMA, SS. 1989. **A note on the effect of diphenyl fumigant to enhance shelf life of grapes**. *Haryana Journal of Horticultural Sciences*, 18: 1-2, 61-64; 3 ref.

Fully ripe grapes of the cultivar Champion were harvested, packed in ventilated paper-lined and paper-cushioned wooden boxes with diphenyl [biphenyl] either applied as a spray over the paper lining or paper cushioning, or as tablets placed inside the packing. The grapes were stored at 5 ± 2°C for up to 42 days. The least physiological weight loss and decay after 42 days was observed in grapes stored with the paper lining impregnated with diphenyl.

985 SINGH, JP; SINGHROT, RS; SHARMA, RK; SANDOOJA, JK. 1987. **A note on comparison of zero energy cool chambers versus room temperature in combination with antifungal fumigants for storage of grapes**. *Haryana Journal of Horticultural Sciences*, 16: 1&2, 92-97

Perlette grapes harvested at the full ripe stage were packed in ventilated 5-kg wooden boxes lined with paper treated with various antifungal chemicals. Some boxes were held at room temperature (36 ± 6°C) and other in zero energy chambers (23.5 ± 8.5°). The grapes were held for up to 8 days. Physiological weight loss after 8 days was lowest (17%) in the treatment with KMnO4 at 1000 p.p.m. in both storage variants. Decay afer 8 days was lowest (27.2%) in both holding treatments with diphenyl, and next lowest (30%) with KMnO4 in zero energy chambers. The effects of treatments on grape chemical composition were also assessed and the data are tabulated.

986 SINGH, JP; KAINSA, RL. 1983. **Microbial flora of grapes in relation to storage and spoilage**. *Indian Phytopathology*, 36: 1, 72-76; 10 ref.

The microbial population of freshly harvested Perlette and Delight grapes was studied and the relative importance of the microorganisms determined in packings from 2 different harvest dates. *Aspergillus niger, A. rugulosus, A. terreus, Penicillium chrysogenum* and Saccharomyces sp. were consistently present on both grapevine cultivars during the fruiting season. Much of the decay in the packs was caused by *A. niger, Rhizopus oryzae* and Saccharomyces sp.

987 SUBBURAMU, K; SINGARAVELU, M; NAZAR, A; IRULAPPAN, I. 1990. **Pre-harvest spray of calcium in grapes (*Vitis vinifera*)**. *South Indian Horticulture*, 38: 5, 268-269.

Pre-harvest sprays of 0.6% calcium chloride or 1.0% calcium nitrate were applied to Muscat grapes 20 days before harvest in Nov. 1989. After harvest the grapes were stored in plastic trays under ambient conditions and assessed for weight loss after 3 days, shelf life, sound fruits after 8 days, spoilage between 4 and 8 days, TSS, acidity, and the TSS:acid ratio. The data are tabulated. The percentage of sound fruits after 8 days was 51.1, 35.2 and 19.3% in the $CaCl_2$, $Ca(NO_3)_2$ and control treatments, respectively. Fruit quality was also best when $CaCl_2$ was applied.

Storage decay

988 ARUN ARYA; ARYA, A. 1988. **Control of Phomopsis fruit-rots of grapes and guava**. *Indian*

Phytopathology, 41: 2, 214-219; 9 ref.

To control postharvest fruit rots of Thompson seedless grapes and Allahabad Safeda guavas caused by *P. viticola* and *P. psidii*, respectively, fungicides, antibiotics, crude leaf extracts and fixed oils were tested in vitro and in vivo. Satisfactory control was achieved with Bavistin [carbendazim], Difolatan [captafol], Calyxin [tridemorph] (each at 1000 p.p.m.), Dithane M-45 [mancozeb] (1250 p.p.m.) and 50% Eucalyptus and *Aegle marmelos* leaf extracts. Of the antibiotics and fixed oils tested, idifulvin (griseofulvin) and mustard oil were the most effective.

989 PRAKASH, GS; REDDY, BMC; DASS, HC. 1983. **Effect of NAA with urea on the post-harvest berry drop of Anab-e-Shahi grape (*Vitis vinifera L.*)**. *Singapore Journal of Primary Industries*, 11: 1, 49-51; 8 ref.

Bunches of grapes of uniform maturity and size were sprayed 3 days before harvest with 25 or 50 p.p.m. NAA alone or in combination with 0.5% urea. Controls were sprayed with water. All treatments reduced the proportion of post harvest berry drop, the treatments including urea being more effective than NAA alone. Post harvest berry drop was lowest in bunches sprayed with 25 p.p.m. NAA + 0.5% urea (20.37% compared with 36.5% in controls).

990 SHANKARAIH, V; ROY, SK. 1991. **Effect of containers, on total losses during grapes transportation and improvements for reduction in 3 years**. The Hegue: Kluwer Academic Publishers.

991 SHARMA, RC; DHARAM-VIR; VIR, D. 1986. **Efficacy of fungicides XXXVII. Evaluation of some chemicals and antibiotics for the control of post-harvest spoilage of grapes caused by *Aspergillus niger***. *Indian Phytopathology*, 39: 4, 587-588; 5 ref.

The best results were obtained with Bavistin [carbendazim] which increased the shelf life to 8 d with only slight decay at 12 d.

992 SHARMA, RC; VIR, D. 1984. **Efficacy of fungicide XXII. Evaluation of benzimidazole, an antibiotic and other fungicides against post-harvest spoilage of grapes**. *International Journal of Tropical Plant Diseases*, 2: 1, 5-7; 8 ref.

Of 9 treatments tested, those most effective against spoilage in transit and storage caused by *Penicillium canescens* were difolatan, benomyl and carbendazim used as suspension dips. Infection was checked and shelf life enhanced.

993 SHARMA, RC; DHARAM-VIR; VIR, D. 1986. **Evaluation of some fungicides against postharvest fungal spoilage of grapes**. *Indian Journal of Mycology and Plant Pathology*, 16: 1, 89-90.

Grapes were injured by pricking and sprayed with a mixed spore suspension of *Penicillium canescens* and *Aspergillus niger*. No disease was observed up to 8 d incubation when fruits were stored in VFI (volatile fungal inhibitor) paper wraps or treated by dipping in carbendazim or difolatan. After 12 d, disease incidence was least in VFI wraps.

994 SHARMA, RC; DHARAM-VIR; VIR, D. 1985. **New post harvest diseases of grapes**. *Indian Journal of Mycology and Plant Pathology*, 15: 2, 200.

Penicillium canescens and *Rhizopus nigricans* [*R. stolonifer*] were found causing fruit decay of grapevine during a survey of the Delhi market.

995 SHARMA, RC; DHARAM-VIR; VIR, D. 1985. **Post harvest Cladosporium rot of grapes and its control**. *Himachal Journal of Agricultural Research*, 11: 2, 89-91; 7 ref.

A C. sp. distinct from *C. herbarum* or *C. oxysporum* causes heavy losses of grapes in Delhi fruit markets. In in vitro tests with 11 different chemicals, the best control of mycelial growth was given by benomyl, carbendazim, thiophanate-methyl and thiabendazole at 500 p.p.m.

996 SHARMA, RC; DHARAM-VIR; VIR, D. 1986. **Post-harvest diseases of grapes and studies on their control with benzimidazole derivatives and other fungicides**. *Pesticides*, 20: 9, 14-15; 10 ref.

Spoilage is mainly caused by *Aspergillus niger, Penicillium canescens, Alternaria alternata* and *Cladosporium sp*. Post-harvest treatment with carbendazim and thiabendazole and wrapping with VFI-impregnated paper checked infection by *A. niger* and enhanced shelflife. VFI-paper however, caused fruit skin discoloration. Aureofungin, Pan[o]ctine [guazatine] and 2,4-D were effective against *A. alternata*.

997 SINGH, JP; SHARMA, SHUSHIL; YAMADAGNI, R. 1985. **Control of post harvest black mould disease of grapes**. *Indian Phytopathology*, 38: 3, 531-532; 4 ref.

Aspergillus niger was best controlled by diphenyl used as a protectant and eradicant. Stable bleaching powder was second of the 4 chemicals tested while sodium metabisulphite was a good protectant but not eradicant.

998 SINGH, K; MANN, SS; BAJWA, MS. 1985. **Effect of auxins, sodium benzoate and calcium chloride on post-harvest berry drop in Himrod grapes**. *Acta Horticulturae*, No.158, 413-418; 17 ref.

Of the chemicals tested, all applied 14 or 28 days before harvest, Planofix [NAA] at 100 or 150 p.p.m. applied 14 days before harvest gave the greatest reduction in berry drop. The treatments generally increased TSS but had little effect on percentage acidity.

999 TULASI RAMAN; SUSHEELA SANKARAN; RAMAN, T; SANKARAN, S. 1989. **Biochemical changes during fruit rot of grapes caused by *Curvularia lunata var. aeria Ellis***. *Indian Journal of Mycology and Plant Pathology*, 19: 2, 211-212; 5 ref.

Postharvest infection by *C. lunata* [*Cochliobolus lunatus*] *var. aeria* caused twice as much decline in ascorbic acid content after 12 d as that in healthy grapes. Total sugars declined from the 2nd day of incubation and the decline was more pronounced in diseased fruits.

1000 ULLASA, BA; RAWAL, RD. 1986. **Studies on American rot of grapes due to *Greeneria uvicola* from Bangalore, India**. *Indian Journal of Plant Pathology*, 4: 2, 154-161; 13 ref.

Details are given of the occurrence, symptomatology, post-harvest losses, control and cultural characters of *G. uvicola*, which causes berry rot, and leaf and twig blight, resulting in die-back symptoms. All the common grapevine cultivars (e.g. Bangalore Blue, Thompson Seedless, and Anab-e-Shahi) were very susceptible. Storage decay was controlled best by captan and Difolatan [captafol].

1001 WADIA, KDR; MANOHARACHARY, C; JANAKI, CH. 1983. **Fruit surface mycoflora of *Vitis vinifera L.* and *Capsicum annuum L.* in relation to their fruit rot diseases**. *Proceedings of the Indian National Science Academy, Pt. B. Biological Sciences*, 49: 4, 371-376; 20 ref.

A relationship was demonstrated between the fungi associated with the fruit surface of ripened grapes and green chillies (*C. annuum*) and fungi responsible for storage decay. Infection follows mech. injury during usual handling practices.

VEGETABLES

Postharvest handling

1002 CHADHA, ML. 1971. **Techniques of handling and storing vegetable seeds**. *Germplasm collection, evaluation, documentation, and conservation*. Asian Vegetable Research and Development Center, P.O. Box. 205, Taipei 10099. p. 62-68.

1003 VILLAREAL, RL; SHANMUGASUNDARAM, S; CHADHA, ML. 1993. **Harvesting and postharvest management**. *A Primer on Vegetable Gardening*. Taipei, Taiwan: Asian Vegetable Research and Development Center, P.O. Box. 205, Taipei 10099, p. 169-188.

Preservation

1004 HASAN, AKJ; CHOUDHURY, N; BEGUM, A; NAHAR, N. 1993. **Preservation of vegetables by microbial activity and radiation**. *World Journal of Microbiology & Biotechnology*, 9: 1, 73-76.

Two locally-produced seasonal vegetables, carrot and patol, were preserved in brine, with and without radiation, with marked changes in their properties as foods and their microbiology. The treated vegetables could be preserved, at optimum salt and irradiation levels, for up to 60 days without becoming unacceptable in terms of appearance, texture, flavour and taste. The optimum salt concentrations for preservation of carrot and patol were 2% (w/v) and 3% (w/v), respectively. The microbial load initially showed an upward trend and then declined after 5 to 10 days of storage. Lactic acid bacteria predominated in treated vegetables.

1005 VIJAY, S; ANAND, JC. 1982. **Chemical preservation of vegetables at room and low temperature**. *Ind. J. Agric. Sci.*, 53: 3, 536.

Storage

1006 DEORE, BP; BHARUD, RW. 1990. **Growth, yield and storability of fenugreek as influenced by foliar spray of growth substances**. *Journal of Maharashtra Agricultural Universities*, 15: 2, 208-210; 13 ref.

A field trial was carried out on fenugreek (Trigonella foenum-graecum) cv. Pusa Early Branching during 1985. The treatments were foliar sprays of 20 p.p.m. GA3, 0.5% ascorbic acid, 20 p.p.m. IAA, 0.25% urea, water and no spray. Leafy vegetable fenugreek (methi) was stored in bamboo baskets and sprinkled with water, in perforated plastic bags, in a wet cloth covering or in open bamboo baskets. Physicochemical analysis of fenugreek was carried out after 24, 48 and 72 h of storage. All growth regulators produced higher yields compared with the control; highest yield being obtained with 20 p.p.m. GA3 (203.33 q/ha). This treatment also