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Postharvest Management in Agriculture

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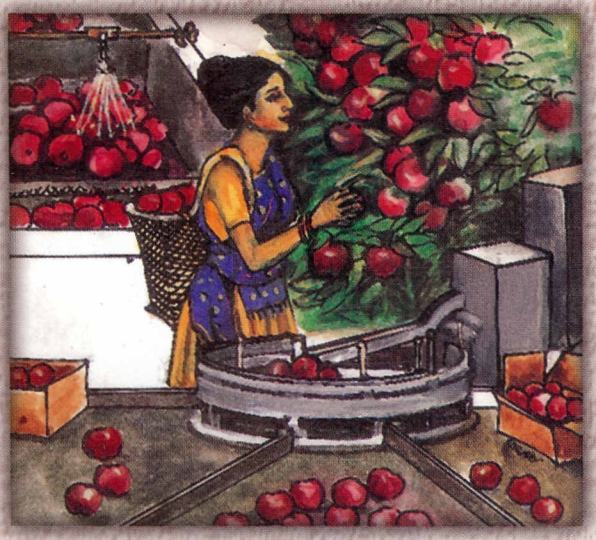

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A S Chandel and R M Kamal

SAARC Agricultural Information Centre (SAIC)

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CONTENTS

October. for decreasing post-harvest losses in the Punjab.

490 RAMANATHAN, G; OYYARAM, G. 1989. **Quality sugar production in Ambur Co-op. Sugar Mills. An experience shared**. *SISSTA Sugar Journal*, 15: 2, M4-M9.

Measures taken at this Indian cane sugar factory to improve sugar quality and decrease losses in molasses are described. These included addition of phosphoric acid to mixed juice to give >300 p.p.m. P_2O_5, modifications to juice heaters and vacuum pans, use of a scale inhibitor, seeding 'B' and 'C' pans with Appel Boom slurry (prepared by a method which is described), washing 'A' massecuites in the centrifugal with superheated water, and drying the sugar with desuperheated steam at 210-220°C.

491 RAZZAQ, A. 1992. **Mechanization of sugarcane production in Pakistan**. *Progressive Farming (Pakistan)*, 12: 1, p. 38-42.

492 REDDY, GS. 1990. **Drying and cooling of sugar by fluidized bed - the first of its kind in Indian sugars industry**. *SISSTA Sugar Journal.*, 16: 3, 63-76.

In conventional drying by vibrated multi-tray hopper, attrition seriously damages crystals, decreasing the commercial yield, impairing brightness and polluting the workplace with dust. A gentler, more efficient system is a fluidized bed in which the air flow is adjusted to give a mixture of smoothly fluidized and agitated bubbling fluid bed. Confabs Thermo Systems Pvt. Ltd. of Bangalore have developed the CSL-I plug flow dryer-cooler, consisting of a bucket-and-chain elevator, drying and cooling sections (supplied with steam-heated and water-cooled air streams), and venturi-type scrubber. Its design is described with diagrams, and performance trials are reported with tabulated results. The design target (decreasing the moisture content from 0.95-2.0% to 0.06-0.10% at throughput 20 t/h) was achieved with air at 100°C; air at 120-130° caused some charring. Effects of using various hot and cold air blower openings on final temperature, moisture content and entrained crystal size are explained. Less floor space is needed than for the conventional equivalent, since drying and cooling occur in the same unit.

493 SOOD, HC. 1990. **Modernisation programmes for sugar industry**. *Modernisation of Indian Sugar Industry*. New Delhi: Arnold, p. 36-50.

The present status of and challenges to the industry are considered. Contributions from several national institutes and organizations are mentioned and new system designs and process techniques designed to achieve successful balanced, modernized, rehabilitated and expanded factories are outlined. The following are discussed: cane feed and crushing control; cane preparatory devices; Lotus roller; self-setting mills; hydraulic mill drive system; Two Roller Pressure Feed systems; high-pressure steam generation; cogeneration and surplus power; byproduct industries; distillery effluent treatment and energy generation system; Biostil process for continuous fermentation; mechanical vapour recompression; bagasse drying system; process innovations and control; automation of cane juice flow rate; juice pH control system; automatic evaporator control system; continuous juice treatment and filtration system; continuous vacuum pans, crystallizers and centrifugals, and automation at the sugar end. Continuous operations and automation are recommended for ensuring optimum performance and improved efficiency.

494 TAYAB, MAK; THEERTHAMALAI, K. 1990. **Opportunities on the frontiers of sugar processing technology: a brief review**. *SISSTA Sugar Journal*, 16: 3, 18-22; 6 ref.

Several processes discovered in the past ≈10 years are considered for use in the (Indian) sugar industry: raw juice filtration by deep sand bed filter; elimination of sulphitation by removal of colloidal material on sintered SS filters (pore size 0.01-0.5 μm) then decolorization with H_2O_2 or activated carbon; mild aerated defecation for making very low colour sugar, whose quality is closer to refined than plantation white sugar; raw juice purification by electroflotation; concentration of clear juice by reverse osmosis to e.g. 40°Bx, possibly followed by freeze-drying instead of evaporation; conversion of bagasse to high-value products, possibly doubling the revenue from each ton of cane and hence strengthening the industry.

CASSAVAS

Postharvest handling

495 BALAGOPAL, C; MAINI, SB; POTTY, VP; PADMAJA, G. 1980. **Microbial rotting of cassava roots**. *Seminar on Post harvest Technology*. 1980: 22-23 Feb. Trivandrum: pp. 23.

496 BALAGOPALAN, C; RAY, RC. 1993. **Biotechnological approaches for cassava utilization in India**. *First international scientific meeting cassava biotechnology network: proceedings*. (Cali (Colombia): /edited by

WM Roca; AM Thro. Centro Internacional de Agricultura Tropical, Cali (Colombia) p. 283-291.

497 BALAGOPALAN, C; PADMAJA, G; MOORTHY, SN. 1986. **Fermentation of cassava for the production of industrially important products.** *CTCRI Annual Report 1985*, Central Tuber Crops Research Institute, Trivandrum, India. p. 34-38.

Attempts were made to develop a solid fermentation process for protein enrichment of a composite meal of cassava flour, cassava starch factory wastes and rice straw with a *Pleurotus sp.* Maximum protein was obtained (33.52%) in a combination of 25% flour + 50% straw + 25% factory wastes. Another experiment was carried out to study the production of lactic acid in fresh cassava and cassava starch factory wastes by enriching with molasses, N and P sources and inoculation with a mixed culture of Lactobacilli and Streptococcus. Maximum production was obtained in cassava + cassava waste (50g) + molasses (2g).

498 MAINI, SB; BALAGOPAL, C. 1978. **Biochemical changes during post harvest deterioration in cassava.** *J. Root Crops*, 4: 1, 31-33.

499 MAINI, SB. 1980. **Export potential of cassava.** *Food & Beverages*, 3: 5, 12-14.

500 NAPHA LOTONG; LOTONG, N. 1991. **Utilization of cassava and cassava waste through fermentation technology.** *Biotechnology for energy: Proceedings of International Symposium on Biotechnology for Energy*. (Faisalabad: 1989: 16-21 December)/edited by KA Malik; SHM Naqvi; MIH Aleem. Faisalabad: Nuclear Institute for Agriculture & Biology, p. 101-106.

Over 400 isolates of moulds were screened for raw starch digesting enzymes and *Aspergillus J8* and *Rhizopus N37* were selected for further investigations. Crude enzymes obtained from wheat bran was higher than from rice bran. Crude enzyme from *Aspergillus* is active at pH 4.0, whereas that from *Rhizopus* is active at pH 5.0. J8 gave a higher yield of enzyme, however, *Rhizopus* can grow under anaerobic condition so it might be suitable for silage fermentation. Selection of yeast str. was accomplished and it was found that *Saccharomyces cerevisiae* SC90, the local commercial str. (non-flocculent) performed best in fermentation of cassava mash. Another str. AM12, a flocculent fusant str. derived from fusion between a flocculent str. and a sake brewing str. was comparable to that of commercial str. at normal temp. but performed better at higher temp. up to 40°C. It is unlikely that fuel alcohol produced from raw cassava will be able to compete with petroleum fuel at this moment. However, silage fermentation to increase nutritional quality of the silage through selected strs of microorganisms should be investigated further.

501 PADMAJA, G; BALAGOPALAN, C. 1991. **Effect of molasses and urea on the silage fermentation of cassava tubers.** *Tropical Science*, 31: 3, 257-264; 20 ref.

Cassava [*Manihot esculenta*] tubers were chopped into pieces about 10 mm long and ensiled without additives or with 4.5% molasses and/or 0.6% urea (FW basis). DM content, pH, protein, starch, water-soluble carbohydrates and lactic acid were analysed after 2-72 d. Molasses reduced the DM loss during ensiling from 16% to 4%; urea + molasses, or urea alone had less effect. All additives increased lactic acid content, while pH, compared with controls, was decreased by molasses but increased by urea. Molasses decreased the starch and increased the water-soluble carbohydrate content of cassava silage, increased true protein content, and greatly decreased cyanide levels. Urea + molasses also decreased cyanide content, but urea alone gave higher levels than in controls. It was concluded that detoxification of cassava tubers for animal feed could be achieved by ensilage with molasses.

502 RAJA, KCM; RAMAKRISHNA, SV. 1990. **Compositional and pasting characteristics of plain-dried and parboiled cassava (*Manihot esculenta Crantz*).** *Food Chemistry*, 38: 2, 79-88; 22 ref.

Compositional and pasting characteristics of cassava flour samples prepared from plain-dried and parboiled chips of the M-4 variety were examined. Parboiling reduced the concentrations of amylose, fat, reducing sugars and minerals. The profiles of the major fatty acids, palmitic, oleic and linoleic, remained generally similar in plain-dried and parboiled samples. Modifications in the pasting properties of cassava flour attained as a result of parboiling were reflected in the relatively low peak/maximum paste viscosity, higher paste stability, considerably lower breakdown value and higher breakdown ratio of the aqueous slurry prepared from the parboiled samples.

503 ROMANOFF, S. 1989. **Social science monitoring as a management tool for directing the benefits of new agricultural technology to the poor.** *IIMI Publication - Social science perspectives on managing agricultural technology*, /edited by D Groenfeldt; JL Moock. International Irrigation Management Institute, Colombo, Sri Lanka. No. 86-22, 193-206; 2 fig., 4 tab., 9 ref.

This paper presents the results of a study which monitors the introduction of an agro-industrial technology for processing the starchy roots of cassava for animal feed. CIAT transferred the technology from Thailand to Colombia, where groups of farmers began building drying plants under the guidance of the Colombian Government's Integrated Rural Development Programme (DRI). DRI is a funding and co-ordinating programme that implements projects through existing agencies. It discusses management decision at different levels of the project and how those decisions directed or could have directed the benefits of the project to particular beneficiaries. The analytical approach is a simple paradigm: a variable that can be manipulated by a manager is correlated with some beneficiary characteristic. The paper concludes with a note on a related experience in Ecuador and the limits of management and monitoring.

504 SHARMA, P; CHATTERJEE, SK. 1982. **Tuber rot of *Dioscorea prazeri* caused by *Fusarium solani* during storage**. *Indian Phytopathology*, 35: 1, 165.

On the basis of isolation and pathogenicity studies, with F. isolates from stored tubers, *F. solani* is considered to be the pathogen of tuber rot.

505 WEERASINGHE, B; NAQVI, SHZ. 1985. **Some comparative physiological studies on selected isolates of *Botryodiplodia theobromae Pat.* causing storage rot of yams cassava and sweet potato in Nigeria**. *International Biodeterioration*, 21: 3, 225-228; 11 ref.

Host specificity of 3 isolates of *B. theobromae* from yam, cassava and sweet potato is reported. Physiological differences between the yam and sweet potato isolates were established in their growth on selected sugars, pattern of extracellular enzyme production and pathogenicity under different temperature and relative humidity regimes.

TOBACCO

506 CHATURVEDI, VK. 1990. **A new method of grading and determining quality index of the jati tobacco (*Nicotiana tabacum L.*)**. *International Journal of Tropical Agriculture*, 8: 2, 101-108; 7 ref.

In a study in 1984-85 of leaves of tobacco cv. Chama and Podali collected from 5 villages in the Cooch Bihar district of West Bengal, the price of tobacco was positively correlated with area of brown patches (maturity index), oiliness and leaf weight, area and length, but negatively correlated with area of spots and blemishes. Path analysis showed that leaf weight and area of brown patches were the main price determinants, and a new grading system and method of determining the quality index is presented using these quality measures.

507 KAUL, PK; SAXENA, NK; SHARMA, PD. 1990. **Mycoflora of tobacco leaves and tobacco products**. *International Journal of Ecology and Environmental Sciences*, 16: 2-3, 179-185; 7 ref.

Among the 14 fungal species (12 genera) isolated from tobacco leaves, the most common were *Alternaria alternata*, *Aspergillus fumigatus*, *A. niger*, *Cladosporium cladosporioides*, *Curvularia* [*Cochliobolus*] *pallescens*, *Epicoccum purpurascens* [*E. nigrum*], *Mucor*, *Penicillium* and *Rhizopus nigricans* [*R. stolonifer*]. The mycoflora of chewing and smoking tobacco was very similar to that of tobacco leaves. Chewing tobacco harboured more fungi than smoking tobacco and tobacco of low grade cigarettes more than expensive high grade cigarettes. Poorly processed chewing tobacco and poorly flue-cured smoking tobacco may introduce these microorganisms into human systems, resulting in health hazards.

508 KRISHNAMURTHY, S; RAGHAVAIAH, CV; SARMA, CB; ATHINARAYANAN, R. 1990. **A profitable innovation in curing cigar filler tobacco**. *Tobacco Research*, 16: 2, 95-98; 3 ref.

In trials in 1985-87 the effects of curing tobacco in the sun or the shade and stringing the leaves on poles with 15, 20 or 22.5 cm between rows on leaf yield, burning quality, speed of curing and economics were studied. Shade curing gave higher whole leaf and total cured leaf yields than sun curing. Method of stringing did not affect yields, although 15 cm between poles and stringing the leaf gave the highest leaf yield. Burning quality was unaffected by curing method, but leaf burn was better with more space between the rows of strings. Curing in the shade with 15 cm space between rows gave a net saving of Rs.740/year compared with sun curing using the normal method of stringing on poles.

509 PANDEY, PH; BHOLE, NG. 1990. **Drying characteristics of Indian tobacco**. *Proceedings of the International Agricultural Engineering Conference and Exhibition*. (Bangkok, Thailand: 1990: 3-6 December)/edited by VM Salokhe and SG Hangantilebe. Bangkok: Asian Institute of Technology, p. 553-560.

The drying characteristics of tobacco using unheated and heated air were determined using a laboratory model tobacco drier designed and developed at the College of Agricultural Engineering, Pusa Bihar. Single tobacco plants, mature and green leaves were dried at 4 temp