

Although a number of varieties of mangoes are grown in the Province, only Baneshan and Neelum have so far been found suitable for canning. Fortunately, these are commercial varieties and are therefore, suitable for canning on a large scale. The juicy 'Rasam' varieties can be made into mango squash. Mango jam can be prepared from many of the varieties. Pineapples, guavas, grape-fruit, plums, etc., can also be canned. Jack fruit, musk-melon and palm kernel are also suited for canning.

Jams, jellies and marmalades can be prepared easily from many of our fruits. Fruit juices, squashes and cordials, which are delicious and healthy drinks, and are in great demand in any tropical country, can be prepared by simple methods. Little known fruits like woodapple, cashew apple, custard apple etc., have been transformed into excellent products. Home-drying and dehydration of fruits and vegetables by modern scientific methods is fairly simple. Luxury articles like candied and crystallised fruits, candied citrus peels etc., can be prepared at home. Thus there are several ways in which fruits and vegetables can be prepared and preserved. To popularise fruit preservation in the country, a number of steps have been taken. A short course of three months training in fruit canning and preservation has been started at the Government Fruit Products Research Laboratory, Kodur. A number of simple and helpful articles have been published regarding fruit preservation. Radio talks have been given. Fruit products are exhibited in different Exhibitions and actual demonstration of preservation arranged. Five lady fruit preservation demonstrators have recently been employed to popularise fruit preservation in the Province. Simultaneously there is a vigilant inspection staff also to see that fruit products sold by manufacturers to the public keep upto certain well-defined standards of quality. It is felt that when the work is in full swing, the laboratory achievements will gradually become practical achievements also.

## Rice Culture in Other Countries and its

### Lesson for Madras\*

By

M. B. V. NARASINGA RAO

(Paddy Specialist)

It may appear presumptuous for me to attempt to deal with rice cultivation in foreign countries about which I have no personal knowledge but I may be allowed this indulgence as it may be of interest to some of us here who have no access to libraries. I may at once begin to deal

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with the culture in other lands with high acre yields of rice, bringing out the salient features which distinguish rice culture there and here without devoting any more time, on personal excuses.

It is officially recorded that the highest acre yield is obtained in Spain with an average of 5100 lb. of paddy. The area of rice in that country is 1.2 lakhs of acres, more or less equivalent to that under the Periyar basin in Tirunelveli District. The cultivation is carried on along lines similar to any of the countries in South-East Asia and it is grown mostly from May to October. But the points which distinguish the Spanish culture from other parts is (1)—A thorough cold weather cultivation. Fields are watered in January, harrowed under puddle, when dry, again harrowed, then ploughed again with mould-board ploughs when in condition. Later it is puddled under water in May before planting. (2)—The use of considerable quantities of suitable nitrogenous and phosphatic manures—240 lb. Ammonium sulphate, 300 lb. of super phosphate and 100 lb. of Potassium sulphate in addition to green manures which are grown without exception on all the areas. (3)—A very liberal but graduated use of water when necessary. No machinery is used, unlike as in the U. S. A.

In Italy which has 4 lakhs of acres under rice, the yield is 3600 lb. of paddy. Here rice is a rotation crop with other cereals and legumes. The area is laid on level fields 20 to 30 acres in extent, so that tractors are used for dry ploughing. Puddling is again done by tractors drawn by horses. Though most of the area is broadcast or drilled, the Italians have fully understood the beneficial effects of transplanting and are trying to evolve a transplanting machinery due to cost of labour. Water is liberally but economically given. Very heavy dressing of farm yard manure combined with artificials are used. Artificial desiccators are developed to dry grain so as to reduce losses in storage.

Bulgaria still uses the wooden husking machine, called 'Dinki' a corrupt form of the 'Dhenki' a levered horizontal beam used in North India.

Coming to the countries in South-East Asia where the bulk of the rice is grown, Japan and China record high acre yields. Japan, called the land of Bounteous Rice Crops has an extent of 8 million acres with an average acre yield of 4000 lb. of paddy. On the whole it is a rugged mountainous land and its hillsides have been terraced and brought into service to an extent unrivalled in any part of the world except probably the 'Ingorots' of the Philippines. The whole of the Japanese culture is what may be termed 'hoe farming', ploughs and animals being scarce. The soils are inherently not very rich but are made rich every year by strenuous work; application of manures and

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judicious and systematic use of irrigation water from every river and suitable reservoirs. The quantity of artificials used will stagger us — upto 100 lb. of Nitrogen 60 lb. of  $P_2O_5$ . In Japan as well as in Southern China paddy fields are kept absolutely clean. Green manures specially *Astragalus sinensis* is raised on 75 percent of the area. The use of certified seeds adds its little quota to the increased yield. Short erect varieties, not large in number, are sown to prevent wastage. Before sowing seed, all light or imperfect grains are removed by soaking in salt solution of 1.3 percent specific gravity. The yields now obtained in Japan are said to be double that of those prevailing 50 years ago and all this is brought about by practising intensive methods of manuring and irrigation and use of improved seed. The season is from June to October during which period only moderate rainfall is received, though this is uniformly distributed.

**China:** The outstanding feature of China rice culture is the use of fertilizers. All offal, of man and beast from city and country, is collected, stored without waste by leakage or by evaporation, allowed to ferment and decay and applied in a liquid form, to the land in small quantities so that none be lost and timed to the needs of the plant. It is applied intensively to the nurseries and the remainder to fields. Thus only this incessant and meticulous care, has made it possible for the Chinese to raise rice 'for ever'; two crops in the same year on most of the lands. The average yield here is 2,500 lb. per acre.

Java has the best developed irrigation system for rice cultivation. The soils are rich and rice is rotated usually with dry crops—maize, groundnut, or tobacco. The yield is about 2,000 lb. per acre; and here the poverty of the cultivator just as in India is a drawback for higher production. In this country an interesting industry in its relation to rice growing is fish culture. The spawn of gold fish is actually planted in rice fields and this industry provides an ideally cheap and easy source of proteins.

The cultivation of rice in the other countries Siam, the Philippines and Malaya is on very similar lines to India. The yields are poor. Much of the land in the Philippines suffers from too many weeds. There is no systematic practice of fertilising the fields. Malaya suffers from uneven distribution of rainfall and the area is scattered in different parts of the country. Fertilising with artificials is seldom practised.

**United States:** The rice cultivation in this country is an example of cultivation where machinery is substituted for human labour as it is highly paid and hard to hire at any price. Hence rice is raised with the least possible use of human labour or animal labour. Almost all the rice land is ploughed up with large tractors. The usual practice is to plough, double disc and then drill the seed. Recently seed is being broadcast

in water by aeroplanes. Sowings are done in May. Lands are usually given rest to control weeds as there is no other way and this improves the fertility. Manuring with artificials is also practised on an extensive scale. Rice is cut with binders and it is found that in this practice the losses vary from 10 to 15 percent. The cut bundles are usually shocked to cure as the grain is usually cut before it is fully ripe. The shocks are then taken to the thresher commonly called separator on bundle wagons drawn by horses or by motors. The sacks from the separator are moved by 'banking-out-wagons' to warehouses and some go directly to the mills. The average yield is about 2500 lb. of grain per acre.

In recent years it is reported that rice cultivation is extending in Australia and areas which are unfit for any crop are brought under rice with irrigation. Here also most of the cultivation is done by machinery and the cost of cultivation is reported to be very high.

It is thus seen that in many countries the acre yields are very high and sometimes there are twice as high as in Madras. Why is this difference? Apart from such factors as the low standard of the actual cultivator, absentee landlordism, inadequate manuring etc, the major difference is the total climatic and ecological factors that differentiate countries like Spain, Italy and even Japan from those of India during the rice growing period. In these rice is more or less an autumn crop with adequate irrigation, favourable for greater root development and production of large amounts of dry matter. In India, most of the rice is grown in the monsoon months where not enough sunshine is available and the high percentage of humidity promotes vegetation at the expense of grain formation. Rice crops grown in the autumn months in the Madras have also given average yields of 4000 lb. over extensive areas. The cultivator in our country is in no way inferior to his compatriot in any part of the world in the job of producing crops. He is of course, illiterate, and not able to follow recent scientific developments, poor and hence not able to give adequate monetary attention to his land.

The following facts emerge from the brief outline of rice cultivation given above. These are nothing very new but their repetition may be excused because of their vital importance to the rice industry.

(1) The rice crop must be made less dependant upon the monsoon by adequate storage tanks. Areas under autumn (kar) and spring (Navarai) cultivation should be increased by more wells and tanks and cheaper power for lifting water. Rice pays for larger and assured irrigation, by (i) longer crops, (ii) more uniformly good crops, and (iii) by making two crops a year safe where only one can be grown without it.

(2) Extended use of all organic wastes; half-decayed straw and compost is found to be particularly suitable in heavy soils.

(3) Greater production and use of artificial manures with green leaf and where it is necessary, with cheap lime.

(4) An extended use of catch and cover crops of legumes. Introduction of pis-ci-culture in rice fields where feasible.

(5) Greater and closer attention to seed distribution methods. The full benefits of intensive rice cultivation are realised only with good seed improved by breeding. A central Seeds Organisation may well be worth consideration.

(6) Research for greater use industrially of waste products of rice as in Japan

## Pastures of the Kangayam tract

By

S. N. CHANDRASEKHARAN, M. A. and D. DANIEL SUNDARARAJ, B. Sc.

(Ag. Assoc. I. A. R. I.)

**Introduction:** Among the different breeds of cattle in India, the Kangayam breed is one of the efficient and scientifically bred animals (3). These are bred mainly in the Kangayam firka in Dharapuram Taluq of Coimbatore district and to a small extent in parts bordering on Erode and Gobi taluqs. The development of this breed has so far been carried on by enterprising well-to-do ryots, the Pattagar of Palayakottai being the foremost. The aforesaid ryots own extensive areas of well organised pastures, the Kangayam tract particularly being one with such good private pastures (2) which might be said to be responsible for the development of this famous breed of the tract.

**Maintenance of Pastures: Fencing:** The large blocks of land owned by the breeders are divided into smaller blocks by live-fencing. These fences facilitate controlled grazing by animals and form an effective protection against their straying away from one block to another, besides functioning as wind breaks. The most effective, popular and easily raised fence is *Commiphora berryii*, Engl. (Mul kiluvai) which is propagated by cuttings. With the beginning of South-West Monsoon, the existing fences are strengthened and new ones are put up. Holes are made by means of crowbars, the cuttings planted into these and are covered. The cuttings are put at least in three alternating rows which establish within a month and form a good live-fence in a short time. *Euphorbia antiquorum*, Linn. (Sathurakalli or Thirugukalli), *E. tirucalli*, Linn. (Tirukalli or Kolkalli), *Agave americana*, Linn. (Railway kathalai) *Azima tetracantha*, Lam. (Sangam mulchedi) are among some of the other fence plants arranged in the order of their respective importance.