importance of the maintenance of the purity of the particular strain or strains. The maintenance of the purity of the seed has to be observed from the flowering stage of the crop till it is harvested to keep it free from contamination or mixture. In the threshing floor and the store room due care in the art of preserving the purity of the seed has to be kept up.

The last item of vital importance in crop production is the needful protection to crops against pests and diseases for a healthy growth. The crop and plant protection service deals in detail with all this problem to help our departmental activities to maximise production through its improved strains and plant materials, which otherwise may not exhibit their maximum potentialities, not withstanding the adoption of correct cultural and manurial methods.

Utilisation of Agency Tracts in Maximising Fruit Production*

By

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Introduction: Several schemes are under way to extend the area under food crops in this State. A comprehensive plan for the development of fruit of this State is yet to emerge. The hillmen of the Agency tracts are yet to understand that fruit should supplement the normal diet for better health. With the cry for more fruit to supplement rice for a well balanced diet, the hill ryot may now usefully divert his attention to the innumerable patches of uncultivated wastes fit for orcharding, at a time when the prices of fruit are attractive. At a time like this, the recommendations of the Royal Commission on Agriculture in 1928 as well as the National Planning Committee, have to be considered seriously. Cheema[1] observed that the development of the horticultural crops in this country has been neglected to a very great extent as compared with the development of cotton, sugarcane, oil seed and such other crops. Round about Anantagiri in Visakhapatnam district, stray trees of common pear, rose apple and coffee bushes were introduced long back. Mandarin, jack,

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mango, pomegranate, rose apple are some of the important fruits raised in the Agency tracts with practically no attention bestowed on them. Acid lime trees exist in the interior agencies. Naik[2] states that to 'provide a significantly higher standard of life and a more diversified, pleasurable, all-the-year-round occupation, to more especially those in the rural parts, the role of fruit industry cannot fail to compel attention.' The result is that the area under fruit is yet to expand. To achieve this, a study of the Agency tracts where more marginal land and cultivable wastes are available, should be carefully made, to keep pace with the modern development and progress in Agriculture. Inferences drawn without such a study will lead to wrong horticultural programmes and policies. It is the purpose of this contribution to outline some of the notable peculiarities of the Agency tracts and how best they can be utilised in maximising fruit production.

Material and Methods: In the desire to make this symposium as comprehensive as possible, free use has been made of several publications and reports relating to the subject. A list of such references referred to, is appended at the end of this Paper.

Data and Discussion: The following data and the findings discussed are based on the knowledge gained by a critical study of the literature, of work done in this direction and correlating at with the experiences of the author who has considerable experience of the Agency tracts of Godavari and Visakhapatnam districts. The data has been divided into the following sections to enable the author to present the subject in a cogent and systematic manner.

Planning the Fruit Industry: (1) *Tract and topography:* Most of these Agency tracts are characterised by a rolling topography. Tracts with elevations of about 4,000 feet above sea-level are not uncommon in Visakhapatnam Agency. Forests alternate uncultivable wastes and marginal lands which are unsuited for arable farming. "Podu" cultivation through deforestation present naked patches. The average annual rainfall received in these regions is about fifty inches. The maximum and minimum temperatures range from about 36°F in winter to about 100°F in summer in Araku Valley. The aspect and topography of land differs from village to village. The severity of the south-west monsoon followed by severe winter conditions and drought and the gradual deforestation of the tract by the ignorant hillmen tend the climate erratic. Perennial hill streams emerging through subterranean springs of forests cause soil erosion and waste waters. Some of the Agency tracts of Visakhapatnam district are susceptible to frost hazard. Considering all these, the choice of the variety of fruit is to be decided. Most of the uncultivated wastes and marginal lands consist of reasonably deep and well drained soils varying from a friable sandy loam to red loam with

uniform texture, but they are deficient in organic matter. Such soils which are fit for growing fruit have to be corrected by frequent applications of large quantities of bulky organic manures. Very slopy lands have to be terraced to avoid leaching of manures applied, during heavy rains. Drainage is not an important problem of these regions. Elevated plots with adjoining lower slopes to drain off cold air during winter are ideal for commercial orchards.

(2) *Harnessing water sources for irrigation:* Alexander Joss of the United States Bureau of Agricultural Economics, states that benefits from irrigation arise only through increased production which the irrigation water makes possible. Several perennial hill streams with plentiful supply of sweet water scattered all over the Agencies, exist. These can be harnessed for feeding the adjoining cultivable wastes to which water if necessary, can be pumped for orchard enterprise. Well sinking, utilisation of the available springs and provision of filter points will benefit the commercial orchards in these tracts. For most of the sites which cannot command irrigation facilities, a variety of hardy fruits such as pomegranate, jujube, Phyllanthus, wood apple, tamarind and the like can be recommended.

(3) *Aspect of manuring:* Narasinga Rau[3] suggests building up of a fruit landscape by a merging of fruit bearing trees into the accessible fringes of forests near and around the villages. Fruit trees when set out on the high humus content of such forest soils, need no larger stocks of bulky organic manures as hardy varieties of fruit can best fit into such a plan of orcharding. Green manuring, green leaf manuring, and cover cropping of orchards with leguminous crops will solve most of the manure problem in these tracts. The latter, will also help in encountering the fodder problem prevalent in some parts of these tracts. Leaf-mould, peat and compost manures can also be thought off to enrich the soil in Agencies.

(4) *Choice of variety:* Investigations carried out in the Government Orchard at Araku Valley for over a period of six years have so far indicated the suitability of the following* varieties for extension in most of these tracts.

It was observed at Araku Valley that Kodur type of acid lime tolerates frost conditions obtaining in the region. Lemon plants need a supplement to the natural rainfall by hand watering during periods of of drought, in the first year of orchard life. Orchards for lemon production should be located near sources of assured water supply. Sweet

* Mandarin: Budded plants of Nagpur santra; Acid lime: Kodur type; Banana:— Sirumalai, Amritapani and Bontha; Grape-fruit:— Poona, Duncan and Special; Guava:— Lucknow No. 49; Pomegranate:— Michaelpatti; Grape:— Red Muscadel; Passion fruit:— Purple fruited; Tree tomato; Cape gooseberry and dwarf types of papaya.

orange and grape fruit varieties detailed above have been observed to withstand the weather conditions prevalent in Araku Valley. Pre-bearing orchards can be intensively inter cropped with bush fruits and vegetables. Fruits tolerant of drought such as pomegranate and jujube can be planted away from water sources, in lands where their culture is possible. Next, but of greater utility, are the backyards and vacant spaces which are a common feature of the villages of these hill regions. These can best be utilised for growing passion fruit, tree tomato and lemon which have proved beyond doubt as suitable for the conditions obtaining in these localities. Banana varieties can be extended to villages which are situated near perennial hill streams.

Problems of Marketing and Transport: As most of these regions are far away from towns or markets where there is a continuous demand for fruit, the problem of marketing takes shape. Transport again is another limiting factor. A co-operative combine has therefore to function in these regions for collective purchase of fruit that is produced and arrange for its transport. Narasinga Rau[3] suggests 'some organisation such as an Indian Horticultural Council that would possess the authority and bargaining power' to safeguard the interests of the fruit growers.

State Aid and Horticultural Policy: It is therefore essential that a horticultural policy should be formulated by the State and immediate steps should be taken to develop the fruit industry utilising Agency tracts in maximising fruit production. To help the fruit growers in these regions, trained horticulturists have an important role to play. The State should establish regional fruit experiment stations in these tracts for studying the local problems and train personnel for organising the villages to take up the development works, leading to an extension of area under fruit. Organisation of fruit growers is also essential for the furtherance of the fruit industry of these regions. Cheema[1] rightly remarked that this is the age of 'co-operative efforts and the growers must organise themselves as prime movers of all activities' which tend to benefit them in the maximisation of fruit production.

Summary and Conclusions:

(i) The immediate need for the expansion of the fruit industry by utilising suitable marginal lands and cultivable wastes for growing fruit is discussed.

(ii) In the planning of fruit industry in these regions, the location of site, topography of the tract, aspect of manuring, problem of irrigation and choice of the variety have all been discussed with the experience obtaining in Araku Valley.

(iii) The problems of marketing and transport and how best they can be encountered are detailed.

(iv) The establishment of regional fruit experiment stations in these tracts for studying the fruit growing problems and also for training personnel for horticultural extension work have been suggested.

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A Review of the Methods of Crop Estimation and Forecast

By

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"It is of primary importance to an agricultural country like India, that it should possess accurate agricultural Statistics which would give at any time a reliable indication of the country's requirements of each agricultural commodity, its exportable surplus if any and its economic position as indicated by supply and demand." (11). A continuous supply of precise and accurate statistical information is a crying need of the modern industrial and economic activities.

Statistics of production engaged the attention of the Board of Agriculture in India, for the first time in the year 1919 when it dealt with the subject of forecast and estimation of crops. Forecasts and estimation of crops, commercial as well as agricultural are of considerable importance to the country. Information of the most probable production