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TOMATO OR LOVE APPLE

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Introduction. Of all vegetables that have recently come to the forefront, Tomato (*Lycopersicum esculentum*) must be given a very prominent place. It is the cheapest and most easily grown vegetable and a very valuable fruit from a nutritional view point. It contains vitamins A, B and C in plenty and is one of the richest sources, of these. This paper is only an attempt to record in brief outline, some of the observations made and experience gained during the last two years, when the writer was privileged to be in charge of the orchard and vegetable garden in the Central Farm. As the value of vitamins in human and animal nutrition becomes increasingly known this fruit is bound to come to greater prominence. It is both a fruit and a vegetable and since it can be eaten raw, the vitamins contained in it are not lost. The analysis of the fruit as determined by the Government Agricultural Chemist is interesting.

Results of analysis of Tomato for its food value.

Heads of analysis	Tomato (raw)		Tomato (ripe)	
	% on dry weight.	% on green weight.	% on dry weight.	% on green weight.
Moisture	...	95·48	...	93·61
Ash.	14·07	0·64	16·92	1·08
Proteids	21·20	0·96	24·35	1·56
Ether extractives	6·40	0·29	6·40	0·41
Fibre	12·68	0·57	14·79	0·95
Carbohydrates	45·65	2·06	37·54	2·39
	100·00	100·00	100·00	100·00
Insoluble mineral matter.	0·15	0·01	0·17	0·01
Albuminoids	15·77	0·71	18·44	1·18
Phosphoric acid	1·22	0·06	1·38	0·09
Potash	6·54	0·30	7·44	0·48
Lime	0·31	0·01	0·33	0·02

From the above table it is apparent that the tomato contains a high percentage of moisture at all stages. It is high in protein and hence of great value as a food. It is al[illegible] fibre and hence easily

digestible. It is high in ashes and contains a large percentage of phosphoric acid and potash. It is deficient in lime. The food value also increases as the fruit ripens.

The cultivated tomato of to-day is a native of Tropical America. It has undergone a series of changes before it attained the present level of perfection.

Soils. It can be easily grown on all types of soils. But on a rich sandy loam with good facilities for drainage it yields best. Under conditions obtaining in Coimbatore there is no particular season during which alone it can be grown. Irrigation is the chief limiting factor. During the hotter months of the year, however, it may be somewhat difficult to get the plants established but when once they get established, they yield profusely. With judicious sowing and planting a decent crop can be raised throughout the year. For the proper discharge of pollen and the setting of the maximum number of fruits, a dry atmosphere is most favourable. Bees have not at any time been found to visit the flowers and do not appear to help their pollination.

The preparation of the soil and the general principles of cultivation are almost the same as for any other garden crop. In places like Coimbatore and adjoining districts, where the temperature is high it is advisable to give the land a deep ploughing. If the roots of the plants come in contact with the hot soil on the surface the plants die quickly. The soil should be stirred and pulverised well before planting and a perfect tilth obtained.

Manuring. An initial dose of 10 to 15 tons of good well-rotten farm-yard manure ploughed in sufficiently early (at least a month) before the crop comes in, has been found to be quite beneficial. Artificials can be used whenever found necessary. Potash may be applied at the start and nitrogenous manures in smaller doses later on during the early growing stages. The application of too much nitrogen may induce a leafy growth which is detrimental to the yield. About 2 to 3 cwts. of potash and 1 cwt. of nitrogenous fertiliser can be applied with great advantage. The application of fresh manure seems to delay the ripening of fruits whereas the artificials hasten it.

Planting. Line planting is advantageous and in irrigated soils the field should be divided into ridges and furrows. Each furrow may be formed 3 to 4 feet apart. The seed may either be sown along one side of the ridge and water let in, or a nursery may be raised and the seedlings transplanted when they are 25 to 30 days old. The latter method is however more satisfactory as there is a considerable reduction in seed rate. The seedlings can be planted 1½ to 2 feet apart in the row. Three to four ounces of seed are quite ample to raise a nursery to plant an acre. Tomato can also be propagated by cuttings. These

is no advantage, however, in so doing as the plants raised from seed are more prolific than those raised from cuttings.

Propping. The plants as they grow have a tendency to spread on the ground and require artificial support to make them grow erect. This can be done by driving in stakes 5 to 6 feet long, vertically into the ground and tying the plants on to them. Stakes can also be planted 6 feet apart in rows and horizontal scantlings tied on to these. The plants can then be easily trained on to them. It no doubt is costly. If the plants are allowed to grow on the ground without support they will grow well but intercultivation will not be possible and harvest will be difficult. The fruits that come in contact with the soil and moisture are liable to be spoilt. Propping however, does away with these drawbacks and permits of an easy access of air and sun to the fruits and controls diseases. The plants if allowed to spread on the ground strike root at every node and grow vigorously. In consequence, more fruits are produced sometimes thus more than recompensing for the damage due to rotting.

Pruning. Pruning is another operation which is greatly in vogue, The advantages of pruning under Coimbatore conditions, are, however. doubtful and it has to be done with caution if done at all. Pruning consists in pinching off the lateral shoots at an early stage so that they may not interfere with the development of the racemes produced at the leaf axils. The advantages of pruning are early ripening, reduction of disease and production of bigger fruits.

Interculture. Hoeing and weeding should be done as often as required and the area kept neat and clean. Watering is also quite necessary except during the rains and the leaves should not be allowed to fade. Drainage on the other hand is equally important.

Pests and diseases. The plants are subject to various insect and fungus attacks. These have to be dealt with promptly. Spraying with Bordeaux mixture when the plants are about a fortnight old and repeated 2 or 3 times at intervals of about 2 to 3 weeks, has been found beneficial in checking leaf diseases. Besides being a fungicide, Bordeaux mixture serves as a repellant for several insects.

Varieties. There are many varieties of tomatoes in the market, showing great variation in the size, shape and colour of the fruits. There is also great variation in the thickness of the skin, in the flavour and the juiciness of the pulp. The following are some of the varieties that have been successfully grown in the Central Farm :

Golden queen, Crimson cushion, Perfection,
King Humbert, Erliana, Globe, and Large red,
Peach Ponderosa and Stone.

Notes on the varieties :—

Large Red :— Fruits in bunches of 2 to 3, large, and ribbed, of deep scarlet colour

Perfection is a fine early variety of a fairly good size, quite smooth and thick and of a scarlet colour.

Golden queen is a smooth bright yellow variety of a high yielding capacity.

Stone is again a scarlet variety of a medium size, smooth and meaty with very fine keeping qualities.

Globe is a pink coloured, globe shaped, medium tomato of a good quality.

Ponderosa has a very good flavour, it is meaty, has a tender skin and fewer seeds, large sized fruit weighing up to 2 pound each.

Crimson cushion—fruits of a big size and akin to Ponderosa. Erliana—medium sized fruits, very smooth and solid. It is an early variety bearing in clusters.

King Humbert with shape of a large plum, produced in clusters of 6 to 8, scarlet colour, of a vigorous growth and tough-skinned. It keeps well.

Peach—a small yellow fruited variety, very attractive having a peach like appearance, fruits formed in clusters, less of acidity.

Duration. The crop remains in the field for about five months and yields fruits for about two months. If desired, the crop can be kept longer in the field but experience shows that it is not advantageous to do so. It is better to allow the fruits to ripen on the plant in which case the fruit contains a higher percentage of sugar and less of starch. A ripe fruit also contains a higher percentage of vitamins A and C. For marketing, however, it is advantageous to harvest the fruits when they are just ripening as they keep longer if done so.

Yield. The yield of ripe fruits varies from 15 to 40 thousand pounds per acre depending upon the nature of the soil, the variety, and the season at which it is grown. A mixed crop of tomato varieties planted in an area of about 2 cents during the first week of April 1932 gave a calculated yield of 28,800 lbs. per acre by about the 19th of September 1932. Another crop planted a month later gave an average of 36,000 lbs. of ripe fruits in about the same period. Among this the variety Golden queen gave 43,000 lbs. per acre. The same variety planted on 2—7—1932 gave 43,100 lbs. per acre, even though the average of all the varieties sown at that time was 24,100 lbs. The highest yield so far recorded on the Central Farm was from a 2·6 cent plot which was planted on 8—12—1931, and which yielded fruits from 25—2—1932 to 19—4—'32 It gave 48,000 lbs. per acre. The lowest yield recorded was 10,937 lbs. per acre from a crop sown in July 1931.

Economics. Assuming that the fruit is sold at 6 pies per pound as it is done on the Central Farm, it is possible to get a gross return from Rs. 400 to Rs. 125 per acre. The cost of cultivation including

the cost of artificials may not exceed Rs. 160 per acre which means that tomato cultivation is a profitable concern. The following details of cost of cultivation will be interesting:

Details of Cost of Cultivation.

	Rs.	as.	ps.
Preparatory Cultivation ;—			
Ploughing once with deep plough and thrice with ordinary plough	7	8	0
Manure and Manuring:—			
15 tons of farm-yard manure at Rs. 4 per ton (Half of which alone is charged for tomato)	30	0	0
Cost of 4 cwts. of artificials	30	0	0
Seed and Sowing :—			
Cost of seed, raising nursery and transplanting	6	8	0
After-Cultivation :			
Interculturing and propping with bamboo stakes (these being used for more than one crop)	20	0	0
Irrigation:—			
Once in 10 to 15 days (in rainy weather only when necessary)	54	0	0
Harvesting :—			
Collecting fruits etc.	12	0	0
Total	160	0	0

Uses. The tomato is used for a variety of culinary purposes. It forms a valuable vegetable adjunct with meat and fish preparations. It finds a place in preserves, sauces and jams. The juice is valued as an invalid food because of its high vitamin contents. In the Indian household it is gaining popularity in various vegetable dishes both cooked and raw.

Conclusion. The demand for tomato in Indian towns and villages has not, however, increased so much as to warrant its production to a large extent. At the rate at which the taste for the fruit is now cultivated, there is certainly a bright future for the crop and it is hoped that a time will come when the crying need will be for more tomatoes. If the cry for eating more fruit and the demand for a cheap yet nutritious fruit, induces the average consumer to grow a few plants in his backyard to supply his own needs, the object of this short note will be more than achieved and it is hoped that the "Love Apple" will then be more endeared in the hearts of one and all.

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