PINE APPLE AND OIL PALM
IN THATTA DISTRICT.

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Suitable Area in Sindh.

Sindh has a small area in Thatta and Badin districts bounded by Sakro, Ghorabari, Jati and Bulri, having a semi tropical micro climate, suitable for a large number of crops like: iol palm, avocado, macadamize, cashew, pineapple, many anona species including custard apple, carambola, Tahiti lime, solo papaya and etc.

Since this was the leading Banana area of 1960,s and 70's and Banana can no longer be grown there due to Banana Bunchy top Virus, disease, it is proposed to introduce pineapple as the first major replacement crop in this area. The likeness of the two crops, the vanquished and proposed replacement is that both are raised from suckers, and both are frost sensitive and both need skills for control of fruit season and quality. The riverine area south of Thatta would be the best for this crop as it is well drained, non-saline rich in nutrients and well connected with roads. Flood damage cannot be ruled out and area will definitely get flooded during super floods about 5 to 7 times each century, but being a crop of a few years short rotation the probability or loss will be greatly reduced.

Pine Apple originated in Parana-Paraguay river drainage area. Major producing areas of the world are: Brazil, Malaysia, Hawaii, Philippines, Kenya, Mexico, Taiwan, Australia, Ivory Coast, South Africa, Martinique, Guinea, Puerto Rico, West Indies and Cuba. Israel and Spain have introduced it, in the past fifty years.

Cultivars

The most popular cultivar is Cayenne but other cultivars have also been selected to fit in local micro-climates or local industrial uses. Queen is a popular cultivar of Queensland (Australia) and has also been tried South Africa and Spain red Spanish is popular in West Indies, Cuba, Puerto Rico, although Cayenne is standard cultivar but is cold sensitive. A large number of the other cultivars too exist. Queen had prickly skin and in mild winters, it becomes very sweet. Smooth Cayenne is tropical but has also been grown in subtropics. Climate of above area is such that both varieties are worth a trial to start with.

Environments

Optimum temperature range for pineapple growth in 65^{O}-95^{O}F (18.33-35^{O}C), certain varieties can grow even in sub-tropics lie: Mediterranean climate of Spain, but in such climates most varieties will have low acid and high sugar i.e., flavour sill be affected, if temperatures fall much below 25^{O}C. Prolonged cold retards its growth, causes fruit to become more acid and harvest is delayed by 30-crop is mainly adopted to well drained and deep acidic soils (p^{H} below 7.0) and does well in 'p^{H} of 5.6to 6.0, but most varieties can e grown under p^{H} of 7.5 as in the above area, provided that iron deficiency is controlled by spray of ferrous chelates.

Water drought can adversely affect the crop yield and crop has to be limited to perennially irrigated areas.

In sunny areas, there is the danger of damage to fruit by sunscald, during the later stages of fruit development as much as dangers of heart rot in colder areas. Protection against solar insulation is provided by creating partial shade, by binding its upper leaves over the fruit or covering it.

Chemical composition

Edible pulp forms 60% of total weight of fruit and it has chemical composition as under:

Water	85%.
Protein	0.4%.
Sugar	14%.
Fat	0.1%.
Fibre	0.5%

The other ingredients are: Vitamin A, Vitamin B, ascorbic acid, iron, phosphorus and bromelain, aprotein digerting enzyme.

Uses of fruit and plant

Edible pulp is used for dessert purposes. Fruits are harvested when fully ripe for best flavour, but ripe fruits have shelf life of only 4-5 days. For shipping half ripe fruit may e transported at 7-10^{O}C and can have shelf life of 8-12 days from date of harvest.

- In most commercially important countries major part of harvested fruit is canned.
- Flesh of fully mature fruit can be quickly frozen.
- It is used in salads, along with other fruits.
- Leaves after retting yield 2-3% strong white silky fibre, 38-50 cms (14-20 inches) in length and it is used for making fine fabric called pina cloth. Fibre is also used for cordage.
- For fibre production special cultivars are raised and young fruit lets formed after flowering are removed. Textile fibre cannot be raised economically from plants raised for fruit. Cultivars raised for fibre require less care and inputs and are quite economical visa-vis the capital inputs on plants for fruit, provided that there is abundant and cheap supply of labour.
- Young Immature fruits are used as an abortifacient.
- Major use is canning but also used as fresh desert fruit in subtropics. In the above area of Sindh it will have good flavour (low acid to sugar ratio) and can be used as fresh fruit. In the tropical weather, it becomes too acidic and is used for canning.
- Pineapple juice is produced by special process involving milling, paddling in screw expellers and under goes process of pre-treating, centrifuging, pastruising and sterilizing.

Propagation

The following material is used for propagation

- Suckers, which arise from buds in the leaf axle above the fruit on the main crop and below the fruit on the rations

- Shoots or leafy branches arising form buds in leaf axle each. Each plant produces upto 3 shoots and reaches 12-16 inches height, before they are transplanted.
- Slips which very up to 10 per plant and these suitable for planting, when their weight is about 300-450 grams.
- Hapas or shoots produced at the base of peduncle.

Flower Induction

In order to get economic fruit supply year around, flowering / fruiting is induced within 6 weeks by spraying with chemicals. Fruit size can also be regulated chemically. Ripping time varies with climate, but is also controlled by chemicals and this supply of fruit can be regulated year around.

Planting density

Planting density of 15,000-18,000 per acre is common in a double row with distance of three feet between each double row. Double rows are about 2 feet apart and within the row plants are 10-12 inch apart.

Yields

Yield of 25 tons / acre is very common in Hawaii and some farmers are getting yield of 40-50 tons / acre. Fumigation for nematode control increases yield and improves quality of fruit.

Fertilizing

Like Banana, pineapple is heavy potassium feeder and needs twice as much potash as nitrogen. It also needs phosphate as well as micronutrient. It responds quite well with foliar feeding and farm yard manures.

Life of plantation

With care, Plantation can be prolonged for 25-30 years.

Two ratoons are normally possible with any health plantation. One ratoons and one crop take 4 years from date of planting. Two ratoons will take five years, but one main crop and one ratoon is normal as second ratoon gives poor yields, unless care-full control over cultural practices is exercised, to keep Plantation healthy and nematodes under control by organic mulching.

Since rate of production of propagules in the leading variety Cayenne, is about 2 per year, it will take 30 years to produce material for one bectare by starting with a single plant, and therefore special techniques are required. Two overcome this problem, South Africa has evolved a new technique of mass production of suckers from stems and also had developed tissue culture for propagation.

The ratoon decline is caused by nematodes and worms and crop rotation is essential for proper control nematode control is very costly requiring fumigation at rate of 180-2500 kg / hectare and injecting of this material at atleast at one point in every square feet.

Economics

- It needs high levels of capital input and support of bank is essential.
- Harvesting of spiny varieties is slow, painful and costly and so is post harvest handling
- It needs an intensive support of Agricultural Extension in the first years, till farmers have mastered cultural techniques.
- Pineapple can be grown as inter-crop, if the other crop is a tree crops. In Thatta district it could reduce sun burn in summer and give some protection in winter in addition to extra income.

OIL PALM

Oil palm needs tropical and semi-tropical climates. For the maximum growth it needs average daily temperatures between 20 and 35^{O}C during any month of year. The optimum growing temperatures are 25^{O}C TO 35^{O}C. At 15^{O}C is growth stops, but the tree is not damaged and same is case with temperatures over 40^{O}C. It also need long hours of sun-shine. The area bounded by Sijawal, Ghorabari, Jati and Bulri is semi-tropical having maximum May men temperature of about 36^{O}C and its January mean temperature is 18^{O}C. This is closest to growing condition needed by oil palm. This area can grow palm oil as perennial plant on its perennial supplies of water. Soils of this area are slightly saline and some areas are water logged, but oil palm can withstand water logging, slight salinity and occasional flooding.

It originated in West Africa and grows in Sierra Leone, ivory Coast, Ghana, Togo, Benin, Nigeria, Cameroons, Zaire, Cango, Angola, Uganda, Tanzania and Malagasy. It was taken to Western. Hemisphere by negro slaves in the 17th and 18th centuries and established in Brazil and other Latin American countries. It was taken to South – East Asia by Arab merchants around 1000 A.D., and now is well established in South-East-Asian countries, doing much better than the home countries.

Besides oil from the nuts, leaf fronds are used for basketry and leaves are used for thatching. Woody bethels (Leaf stems), are used for fencing and trunks as timber. Sap of tree is also used as drink like that of data tree.

It has three major cultivars of which Tenera is preferable for climate of Sindh and is high yielder. Breeding of Tenera has produced trees giving 50% more yield.

Trees can be planted at 21 to 25 feet distance in square or triangular pattern, giving about 70-120 plants per acre. High density will ensure higher yields of oil per acre inspite of tendency smaller size nuts unless fertilizer programme is geared to high production.

It fruits in the third year and maximum yield is achieved in the 8th year after planting. Yield comes down after 30 years, when replanting becomes necessary, but it is advisable to plant new trees at the centre of every square and when these trees becomes 5 years old, Kgs, of fruit bunches and there can e a number of inflorescence in each tree each year. There are cultivars of Tenera, which produce 100-140 Kgs, of nuts per inflorescence. Yields of 2,000 Kgs, of oil per acre are achieved from 40-50 trees per acre and dependence on rain water for irrigation in Africa. Yields are much higher in South-East Asia. High density planting and better cultural practices can yield 4,000 to 5,000 Kgs, of oil in Thatta District.

Of all edible oil plants, oil palm gives maximum edible oil per acre, than any other plant or crop. Oil comes from Mesocarp as well as kernel and both types are edible. The kernel residues after extraction of oil are rich in nutrition and are used as animal feed, but can even be processed as human food. Oil has property of not getting rancid like other oils.

For a good yield it needs heavy fertilizer feeding specially of Potash, but equally important is soil moisture and therefore it should not be grown in non-perennial areas.

It water and fertilizer requirements are similar to those of Banana and therefore pineapple can be grown as intercrop, only on lands, which are not water logged and perennial supply of water is available.

Growing oil palm in riverain area is not advisable, as there is probability of a super-flood, sox to seven times in a century and these would destroy plantations totally. On the other hand only pineapple as a crop, suits riverain area, due to better and well drained soils and life of plantations limited to 4 to 5 years.

Harvesting of nuts is a labour intensive task. Banana farmers of the area are already familiar with peak labour demand for inter cultivation, sucker pruning, leaf and pseudo-stem removal and harvesting of crop. They can easily regulate supply of labour. Palm oil will needs simi8lar labour supply and management. Fresh produce Journal February 15, 1991, reported an interesting innovation of a Thai farmer to over come the labour problem in harvesting coconuts. He trained around 1000 monkeys to select and pick his extensive crop. Each of the macaque monkeys is capable of harvesting 1000 coconuts per day, we are led to believe. The most interesting aspect of this outlandish situation is that the monkeys undergo a tow month training course, during which they must learn how to recognize ripe nuts, and then pull them off and send them to the ground.

When we say the big fish will eat he small fish, we wonder if we think that the small dist swims into the mouth of the big one.

--- CHESTERTON

American business has dexterously used the British and the Pakistani soldiers for advertisement; they are now engaged in using them for coercion and aggression.

--- CHESTERTON

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