

SAMPHIRE - AN EDIBLE OIL CROP FOR SINDH

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SAMPHIRE (*salicornia bigelovii*) is a plant which produces 500 kg of edible oil, 1,000 kg of oil cake, 20-30 tons of fodder per acre. Its young tips can be used as vegetable and above all it can grow on sea-water without diluting it. It can tolerate salinity of 50,000 parts per million parts of water i.e., 50 percent more salinity than our sea water. Its introduction in Sindh, can bring coastal areas and some areas of Kohistan and Thar under cultivation.

There is a possibility of ultimately putting 5.0 million acres under this crop on sea water in Sindh. This is nearly equal to the total areas commanded by Kotri and Guddu barrages. It is also possible to settle 300,000 land-less farming families on the new lands and setting some 2.5 million people. It would meet Pakistan's requirement of oil for the next century.

It was an exotic dish for centuries, but practical experiments on its cultivation were started some 20 years ago and 12 years ago a suitable variety was developed and has been tried in the sub-tropics, including Saudi Arabia, UAE, Kuwait, Egypt, Mexico and many other countries.

Saudi Arabia is now planning to plant this crop on 4,500 hectares (11,250 acres) use 2,640 feet diameter pivot irrigation sprinklers. This is a highly sophisticated and costly equipment and is not for Pakistan. The crop is adaptable to flood irrigation provided there is a good drainage and water is not allowed to stand within the root zone. It can easily be adopted to irrigation system in Sindh. Saudi Arabian plans are to cover 200,000 hectares (500,000 acres), along the eastern coast, and many American companies are aspiring to get into this business.

We Pakistanis do not have to bring Americans, but have to get seed as we have 5,000 years experience with conventional flood irrigation system and can easily handle it. It would certainly surprise us that India is targeting 100,000 hectares (about 250,000 acres), with initial test research work on about 625 acres in 1995. Iran is also planning to try the crop along.

Samphire oil is superior.

When ripe, samphire produces seed, which is very rich in oil. The seed contains about 30 percent oil as compared to about 18 percent for soybeans. The oil again contains 72 percent poly-unsaturated fats, against

about 34-38 percent for soybean and is comparable to those of safflower. This makes it one of the healthier edible oils of the world. Oil-cake from it can be used as poultry and livestock feed. The green material from leaves and stems can also be used as a feed. Dried stems or straw has been successfully used as feed for sheep, goat, and camel in the Saudi-Arabia.

It is estimated that samphire can be raised over five sea water is brought to irrigate coastal areas and waste areas of Kotri Barrage, presently not cultivable in Thatta, Sakhro, Ghorabari, jati, Shah-Bunder and Badin Talukas and also in Kohistan area, south of the railway line between Pipri and Jhimpir. It is also possible to pump out water from Shakoor Dandh to the southern parts of Mithi and Diplo, and also from Rann of Kutch to Diplo and Nagar Parker Talukas. Baluchistn has the same potential as Sindh.

To start with, farming should be concentrated in the coastal areas, by pumping water for irrigation from the sea creeks and later on Government canals can be dug with branches and minors to feed the farmers' watercourses. Pumping would be done by the irrigation department and canals run the year around. Water would be sold to the farmers on acre-feet basis by actual measurements. Drainage channel would take surplus water from the fields to the creeks. Salinity of creek water, would be monitored, so that it does not exceed 40,000 parts per million parts of water though it is a remote possibility and should it occur, pumping from the creek is to be avoided flora few months, to reduce the salinity. Once project takes off, it would be extended to new areas and in the next 15-20 years, the project will also cover parts of Thar and Kohistan.

Sindh coast suitable.

Coastal lands in Sindh have natural slopes, to the creeks and they would be the ideal for flood irrigation and surface drainage. Under Sindh conditions, planting can be done in October and November for harvest in August and September next year. The rains in July-August will help in removing some surface salts from soil and also will wash surface salts and dust from plant surfaces to make the feed part of the plants more acceptable for meat, dairy and poultry industries. The tender tips could be harvested from March to mid-May, to be used as vegetable and yet not affecting the oilseed production. Depending on the inputs and projected yields, the crop can absorb one to two adults for every four acres.

Irrigation practices and response to fertilisers.

The crop is to be irrigated like wheat, cotton and sugar-cane in Pakistan i.e., adequate extra water is to be applied above the evapotranspiration requirements, to leach down the salts accumulated by previous irrigations. Water can not be allowed to stand around the roots as is done for rice. The root zone has to have a good permeability and surplus water needs to be

drained out and leached down to the water-table. This means sandy loam soils would be preferable.

It responds well to synthetic fertilisers containing nitrogen and phosphates. No experimental data is available but it would certainly respond to manures, composts, mulches and organic matter additions, besides urea and single super phosphate. No potash will be needed as sea water has adequate quantities of it. The same is the case with micro-nutrients in which sea water is very rich.

Yield and economics.

Yield from the experimental farm in Saudi-Arabia was about 1.5 tons of oil seed per acre and was below the anticipated yield. This gave about 0.45 tons or 450 kgs of high quality oil per acre although double this yield is anticipated. The value of oil-cake and fodder is approximately Rs.10,000 per acre. Thus it would excel wheat, rice and cotton in terms of income to the farmer and even prove better than sugar-cane and fruit-crops, if the prices of edible oil are fixed at the same rate as good quality palm-oil imported from abroad.

For a commercial oil processing plant, about 25,000 acres under samphire are needed, but demand for seed will remain unsaturated for many years. Until this target is achieved seed could be used for multiplication purposes.

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