

Asparagus

A high-value potential vegetable

N.K. Rao and Mohammed Shahid



Asparagus is a innovative vegetable in Indo Pakistan continent. It is a delicacy relished in the West, however, it is only starting catching attention recently in the developing world. Its outstanding merits lie in its high nutritional value, salt-

resistance and easier production technology: being perennial, once established can remain productive for more than ten years.



If not harvested, asparagus spears develop into fernlike appendages.

The United Arab Emirates (UAE) has an arid climate, characterized by very low rainfall, high temperatures and saline groundwater. Despite these constraints, the agriculture sector has made considerable progress over the last two decades. Largely because of government incentives, the area under cultivation has increased from 15,000 ha in the 1970s to a current figure of about 260,000 ha.

Why asparagus?

Although vegetables occupy only a fourth of the total cultivated area, they comprise a significant share of agricultural output, both in quantity and value. In 2001, the UAE produced 720,000 tons of vegetables, meeting nearly half of local demand. The most common vegetables grown in the UAE are tomato, squash and cabbage. International Centre for Biosaline Agriculture's (ICBA's) Genetic Resources Program has been studying various crops for local adaptation and for successful cultivation with saline and marginal irrigation water. The aim is twofold: to provide farmers with a wide range of options and to contribute to the UAE's goal of achieving self-sufficiency in vegetable production. One of these crops, asparagus (*Asparagus officinalis* L.), has significant potential.

Asparagus and its merits

A member of the lily family, asparagus has originated in the eastern Mediterranean region. The crop is one of the most salt-tolerant plants cultivated by humans. Asparagus is grown in many subtropical and temperate parts of the world and is commercially important in France, Mexico, Peru, Spain and the USA. In terms of nutritional value, asparagus ranks among the top 10 vegetables. It is an excellent source

of vitamins A, C and K, as well as folacin (folic acid), riboflavin, niacin, thiamin and minerals like copper, phosphorus, potassium and iron. It is also rich in dietary fiber.

Description of asparagus

Asparagus is a tall upright bush with rhizomes (under-ground stems, called crowns) and fleshy fibrous roots. The rhizome sends up a shoots (called spears) that are harvested and used as vegetable. The plant is dioecious; that is, it bears either female or male flowers, not both. If the flower is female, it produces a small round, reddish berry with six seeds. Pollen is carried from male plants to female plants by insects.

Success of asparagus germplasm at ICBA

ICBA has acquired 10 germplasm accessions from Cornell University. After the seeds were germinated in jiffy packs in December 2006, 12-week-old seedlings were transplanted into a field. During the first year of growth, a single dose of urea one month after planting and two split doses of NPK (20-20-20) were applied by banding alongside the plants. All the accessions grew extremely well



Asparagus berries.

with no incidence of pests. The plants produced large numbers of spears in the spring 2007, which were allowed to grow into ferns and flowering shoots for seed production. The old tops were removed towards the end of the growing season, followed by the application of NPK fertilizer. The spears produced in the second season (spring 2008) were harvested over a period of four weeks and the yield potential of individual accessions was assessed from the average number and weight of the spears harvested per plant. Spear yields (extrapolated from single plant yield) ranged from about 800 to 3500 kg/ha among accessions. Although asparagus normally requires 3-4 full growing seasons for establishment before spear harvest can begin, the crop's performance in this trial showed excellent adaptation and high potential for cultivation under the UAE conditions.

Asparagus - a perennial vegetable

Asparagus is highly favored by today's health-conscious consumer. Unlike most vegetables, asparagus is a perennial crop. Once established, it is inexpensive to maintain and given proper care remains productive for 12-15 years. ICBA will be pleased to make available small quantities of seeds or crowns for horticulturists in the UAE interested in this high-value crop. For prospective growers, the cultural practices to produce asparagus are described below:

Production technology

Asparagus is a perennial which can remain productive for 10 years or more. Therefore, site selection and good soil preparation before planting are important. Asparagus can be grown on many different soils, but it is most

productive on deep, well-drained, sandy loam soils. Soils with high water table should be avoided. Asparagus grows best in regions with a long growing season and sunny days. The ideal temperature for growth is between 18° and 29°C. The optimal pH is 6.5 to 7.0.



Asparagus spears ready for harvesting

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Cultivation

Asparagus is often cultivated on ridges to help with the drainage. The crop can be established by transplanting seedlings or from the crowns. The best time for planting is late winter or early spring. For transplanting, seedlings are grown in plastic bags filled with good potting media and transplanted into the permanent field when they are 3-4 months old. Crop establishment will be quicker with the crowns that are 12 months old. Make a wide furrow 12-15 cm deep, place the crowns in the bottom of the furrow with buds facing up and cover with 5-8 cm of soil. Recommended asparagus spacing is 30 cm between plants and 1.5 m between rows.

Irrigation

Furrow, sprinkler or drip irrigation can be used to grow asparagus. Irrigation schedules depend on the local

conditions, soil texture, crop growth stage, and vary from daily in sandy soils to weekly on heavier soils. Fertilizer requirements depend on the soil type. General recommendation when preparing the field is: 112 kg/ha of nitrogen, 56 kg/ha of phosphorous and 112 kg/ha of potassium, apply. Farm yard manure at the rate of 10-15 t/ha can be substituted for part of the chemical fertilizer. An established asparagus field requires 200 kg/ha of nitrogen and 60 kg/ha of phosphate and 120 kg/ha of potassium annually.

Weeds

Asparagus is a poor competitor against weeds, so keep the field free from weeds. Wilt, rust and crown-rot are the common diseases of asparagus. Thrips, cutworms and aphids are the common insects affecting yields. Sanitation and chemical control help in controlling them.

Harvesting

Once asparagus starts growing, several cycles of fern formation occurs. Mature ferns which turn brown are chopped in late winter or early spring and the beds are reworked to loosen the surface soil, reshaped and fertilized. Harvesting may commence in the second year of planting. Emerging spears of 15-20 cm length are cut just below the soil surface with a sharp knife and graded for packing and marketing. Harvesting period should be limited to 3-4 weeks, with a usual harvest interval of three times a week. Harvesting for too long would reduce the vigor and cause long-term yield decline. However, in tropical environments and with high inputs, two harvests per year is possible with a 4-5 months of fern-growing period between harvests. Asparagus yields reported in literature vary widely from 400 to 15,000 kg/ha. **FO**

Dr. N.K. Rao and Dr. Mohammed Shahid, Plant Genetic Resources Program, International Centre for Biosaline Agriculture (ICBA), Dubai, U.A.E

