

Pointed Gourd: Potential for Temperate Climates

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Pointed gourd (*Trichosanthes dioica* Roxb., Cucurbitaceae) is a tropical vegetable crop with origin in the Indian subcontinent. It is known by the name of *parwal*, *palwal*, or *parmali* in different parts of India and Bangladesh and is one of the important vegetables of this region. The fruit is the edible part of the plant which is cooked in various ways either alone or in combination with other vegetables or meats. Pointed gourd is rich in vitamin and contains 9.0 mg Mg, 2.6 mg Na, 83.0 mg K, 1.1 mg Cu, and 17.0 mg S per 100 g edible part (Singh 1989). It is purported that pointed gourd possesses the medicinal property of lowering total cholesterol and blood sugar. These claims are supported by preliminary clinical trials with rats (Chandra-Sekar et al. 1988) and rabbits (Sharma and Pant 1988; Sharma et al. 1988).

BOTANY

The plant is a perennial, dioecious, and grows as a vine (Fig. 1). Roots are tuberous with long taproot system. Vines are pencil thick in size with dark green cordate simple leaves. Flowers are tubular white with 16–19 days initiation to anthesis time for pistillate flowers and 10–14 days for staminate flowers. Stigma remains viable for approximately 14 hours and 40–70% of flowers set fruit (Singh et al. 1989). Based on shape, size and striation, fruits can be grouped into 4 categories: (1) long, dark green with white stripes, 10–13 cm long, (2) thick, dark green with very pale green stripes, 10–16 cm long, (3) roundish, dark green with white stripe, 5–8 cm long, and (4) tapering, green and striped, 5–8 cm long (Singh 1989).

CULTIVATION

The pointed gourd is usually propagated through vine cuttings and root suckers. Seeds are not used in planting because of poor germination and inability to determine the sex of plants before flowering. As a result, crop established from seed may contain 50% nonfruiting male plants. To propagate from root suckers, tuberous roots of pointed gourd are dug in the early spring, subdivided, and replanted. Both pre-rooted and fresh vine cuttings are used for propagation. Vine cuttings made in the fall of previous year and rooted during winter are planted when danger from frost is over in the spring in order to obtain a crop in the same year. Current year vine cuttings are also planted to establish the crop during the summer, but optimum plant yield is only obtained during the next year. Fresh vines used for field planting should have 8–10 nodes per cutting and should be partially or fully defoliated to check transpiration. The distance between plants is kept between 1.5–2.0 m × 1.5–2.0 m depending on the method of training of vines (Singh 1989; Yadav 1989). A female:male ratio of 9:1 is optimum for ensuring maximum fruit set (Maurya et al. 1985).

Pointed gourd prefers a well-drained sandy loam soil with good fertility. Das et al. (1987) reported maximum early as well as total yield at N:P rates of 90:60 kg/ha, while Kumar et al. (1990) obtained maximum number of fruits/plant when both N and P were applied at the rate of 60 kg/ha.

Vines require training on some form of aerial support system to achieve maximum fruit production (Prasad and Singh 1987; Yadav et al. 1989). Singh (1989) reported 14% higher yield on vines trained on bower system compared to those growing on the ground. In tropics, pointed gourd produces maximum yields for 3–4 years, after which yielding potential gradually declines (Samalo and Parida 1983).

To determine whether pointed gourd can be grown successfully in temperate climates, a study was initiated in 1994 at the Fort Valley State University in Georgia. Cuttings of male and female vines were ob-



Fig. 1. Pointed gourd trained on a fence wire trellis

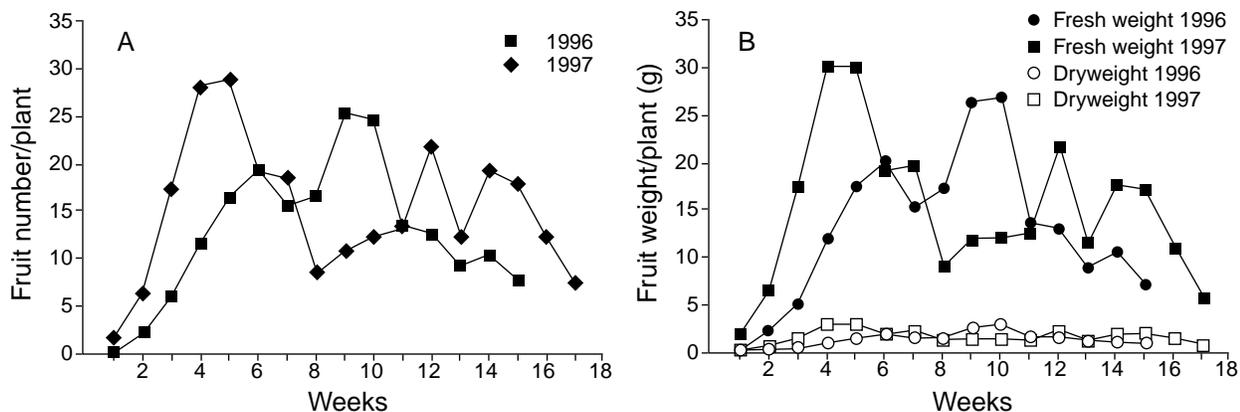


Fig. 2. (A) Per plant fruit number, and (B) fresh and dry weight of pointed gourd on a weekly basis in Georgia during 1996 and 1997.

Table 1. Total fruit number, fruit fresh and dry yields of pointed gourd in Georgia during 1996 and 1997.

Year	Total fruit number		Fresh fruit yield		Dry fruit yield	
	Per plant	Per ha	Per plant	Per ha	Per plant	Per ha
			(kg)	(t)	(kg)	(t)
1996	190	614,840	5.0	16.2	0.5	1.6
1997	254	821,944	6.5	21.0	0.7	2.3

tained from the Department of Vegetable Crops, Narendra Deva University of Agriculture and Technology, Faizabad, India with the assistance of National Bureau of Plant Genetic Resources, New Delhi, India, and National Germplasm Resources Laboratory, Beltsville, Maryland. Cuttings were first multiplied in the greenhouse under mist. Rooted cuttings were planted in the field in six 12 m long rows during April 1995. Planting distance was 1.52 m in the row and 1.83 m between rows. Thus, planting density amounted to 3,595 plants/ha, of which 3,236 were female and 359 male (female:male ratio 9:1). Vines were trained on trellises made of 1.52 m high fence wire. Plants were cut back to the ground level before frost and roots covered with straw to safeguard from cold during winter. Vines sprouted from over-wintered roots during subsequent years in spring when the average soil temperature reached above 12.5°C.

HARVESTING AND YIELD

Pointed gourd vines produced limited number of fruits during 1995, however, full scale fruiting only began in 1996. Fruits were produced for harvest from the beginning of July and continued to the middle of October. There was a continuous increase in the number of fruits produced during the first 4 weeks, thereafter, variation among weekly fruit numbers was dependent on the environmental conditions (Fig. 2). Plants produced fruits for harvesting for 15 weeks in 1996 and 17 weeks in 1997. Harvesting was carried out twice a week to obtain fruits at proper maturity for cooking. Over matured fruits developed hard seeds, rendering them less desirable. It took approximately 15 days for fruits to reach the marketable size from fruit-set. Seasonal pattern for the fresh and dry fruit yield /plant was similar to the fruit number/plant. Total fruit number, fresh and dry yields on per plant basis were higher in 1997 than 1996 (Table 1). Fresh fruit yields/ ha for 1996 and 1997 were 16.2 and 21.0 t, respectively. These yield levels compare favorably to those reported from the Indian subcontinent (Singh 1989).

PROSPECT FOR THE CROP IN THE UNITED STATES

Two main factors will determine the prospect of pointed gourd in the United States: (1) the ability of the plant to adapt to the temperate climate, and (2) market demand for the crop. Research conducted in Georgia clearly demonstrate that pointed gourd can overwinter successfully and produce fruit for approximately 16 weeks during summer with yield comparable to that reported from India. The demand for this vegetable from ethnic minorities from the Indian subcontinent is also high and occasional imports are sold for US \$9–10/kg in International Farmers Markets and ethnic grocery stores. However, since fruit harvest is spread over a long period, pointed gourd appears only suited for production on small areas. Price of this commodity produced locally would probably be similar or higher than the imports. The labor employed in manually harvesting these small sized fruits will have to be paid at a higher rate in the US than the exporting countries offsetting any transportation cost advantage from producing the crop locally. Therefore, pointed gourd provides most opportunity to small farmers living close to metropolitan cities where it can be grown as U-Pick or for supply to International Farmers Markets and ethnic grocery stores. The crop also has potential for production in home gardens where it can provide a nutritious vegetable for an extended period.

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