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Ivy gourd – Thar Sundari for cultivation in dry-land climate

Region-specific vegetable diversity supporting vital nutritious produce to native people. Ivy gourd is most prospective and perennial cucurbit. Its regional variability is not exploited much for developing genotypes suited to high temperature, low moisture stress and resources constraint dry-lands of Rajasthan. With this objectives, targeted germplasm collection was done from 2001–2005 and selected types were studied from 2009 to 2013 at ICAR-CIAH, Bikaner. During spring–summer and rainy–winter season of 2014 to 2016, trait-specific elite-types tested and Thar Sundari exhibited superiority for parthinocarpic fruit yield and marketable quality with 32–45°C day temperature conditions. Tender fruits ready in 6.28–8.42 days from opening of female flowers. Tender fruits are 5.83–6.48 cm length, 1.54–1.89 cm diameter and 11.76–13.54 g weight. Thar Sundari recorded 2.85–3.48 kg/plant/season fruit yield.

INDIGENOUS cucurbits both fresh and dehydrated form ensure nutritious food to inhabitants of tribal and desert area in north-western India. Kachri, kakadia, mateera, tinda and tumba is pre-dominantly grown with traditional cropping of arid region. Whereas bottle gourd, sponge gourd, ridge gourd, ivy gourd and spiny gourd is common in semi-arid climate of Aravali range and tribal dominating areas. Scanty and uncertain rains in monsoon season, extremes of high temperature from March to October and low temperature from November to February, and all these factors together create an environment where few vegetables and their genotypes can grow successfully in the dry-lands of Rajasthan.

Germplasm collection and utilization

Ivy gourd (*Coccinia indica*) is minor cucurbit of eastern, southern and central India. It is also found scattered in tribal dominating districts of north-western India. Plants are creeper, short-perennial and dioecious. In general, local types / land-races are used for crop-plant multiplication and cultivation however few region specific genotypes also in promotion. It is potential vegetable but its regional variability is not utilized for developing genotypes tolerating high temperature and abiotic stress situations. Realizing facts and viability of its commercialization, indigenous germplasm were collected from the traditional growers of the tribal dominating areas in Rajasthan (Banswara, Dungarpur, Udaipur and Sirohi) and Gujarat (Dahod, Modasa, Baria and Godhara).

For field evaluation, population and biased germplasm (cuttings) were established at CIAH, Bikaner. Based on preliminary assessment from 2001–2005, promising types were isolated and characterized. The most potential types were further selected and studied over the years from 2009 to 2013 adopting trellis technology. Trait-specific selections tested during spring–summer and rainy–winter season of 2014 to 2016, and genotype AHIG–1 (Thar Sundari) exhibited superiority for better quality parthenocarpic fruits and marketable yield under extremes of temperature and abiotic stress conditions.

Thar Sundari

Ivy gourd (kundru or tindori) is under-utilized cucurbit and variety Thar Sundari developed through clonal selection from regional diversity of north-western India. It is recommended by ICAR-CIAH, Bikaner in 2018 for cultivation under dry-lands. The gynoecious plants are moderate in growth habit, prolific in bearing female flowers, fruiting and parthenocarpic fruit development under high aridity conditions. Short-perennial plants respond to pruning and re-sprouted with the on-set of

June cuttings and vegetative propagation in poly-crates is best for plant multiplication

December cuttings and vegetative propagation in poly-tubes is best for plant multiplication

spring and monsoon season, and after re-sprouting, it took 50-55 days for first harvesting.

For vegetable culinary, fruits are ready in 6.28–8.42 days from opening of female flowers. Tender fruits of the highest marketable quality (A grade) are 5.83–6.48 cm length, 1.54–1.89 cm diameter and 11.76–13.54 g weight. The elongated-long shape tender fruits are light green-green-dark green in colour with non-clear white stripe and soft. The genotype recorded tender fruit yield of 2.85–3.48 kg/plant/season and yield potential is 248.2–351.7 q/ha with varying production situations and techniques.

Production technology

The systematic experimentation adopting channel and drip system of cucurbits cultivation at CIAH, Bikaner resulted to standardization of ivy gourd production practices and recommended as agro-techniques. In the thoroughly developed field and lay-out plot (50×50 m size), 50-60 cm wide channels or deep-furrows are made at 2.0 m distances which are 25 m length one-side of water-supply line. Here, iron-posts (7-8 feet height) are fixed at 2.5 m distances along the northern side of channel for making trellis system with wire-netting to trail-up vines (vertical cucurbits production technology). For drip irrigation, channels after manure-fertilization converted into seed-beds on which lateral pipes were laid-down (laterals 14-16 mm and 4 lph in-line emitters at 50 cm distances).

Here, only channels/seed-beds were fertilized with FYM (50 q), vermin-compost (5 q), DAP (100 kg), SSP

Trellis technology of ivy gourd cultivation

Cut-down of established ivy gourd plants at ground-level and surface covering during winters for early crop

Plant growth character studies

Leaf and female flower characters of Thar Sundari

Parthenocarpic fruit growth development in Thar Sundari

Marketable quality tender fruits of Thar Sundari

(100 kg), urea (50 kg), MOP (50 kg) and 10 kg neem-leaf powder as basal application/hectare/year. It is given twice i. e. first week of February and on-set of monsoon in July month and mixed thoroughly.

Semi-hard stem cutting from 4–5 month old vines, pencil thickness, 18–22 cm length and 5–7 nodes are ideal for plant multiplication. About 10,000 rooted cuttings are enough for hectare planting. For this, nursery is raised 35–40 days prior to field planting. Well rooted plants with 5–8 leaves and 25–30 cm length are planted at inner-down slope of channels or near to drippers of lateral lines. Planting is done at 50 cm distance marked points and gap-filling is done at 18-21 days, and allowing one healthy plant/point.

With normal rain and weather conditions, ivy gourd is irrigated at an interval of 10-15 days only in channels or 3-4 days for 1.5-2.0 h with drip technology under sandy soils. Inter-culture operation such as hoeing-weeding, urea application @ 50 kg/ha in three split doses and prophylactic spraying of insecticides to manage minor insect-pests is done at 18-21, 35-40, 55-60 and 70-75 days so that the plant growth is effective. For higher marketable yield, tender fruits should be harvested at 3-4 days interval and graded (A and B) for better premium.

Ivy gourd is perennial and Thar Sundari is the gynoecious. Its vegetatively propagated female plants producing parthenocarpic fruits and therefore no male is needed for pollination. Plants of the variety are moderate in growth habit and response to pruning. It is susceptible to low temperature and frost, and thus vines are cut-down near to ground with on-set of winters. With normal practices, plant re-sprouts in first week of February, starts growth, flowering and fruiting continuing to April–June. To harvest second crop, established plants are further cut-down near ground-level in June. Vines re-sprout with on-set of monsoon rains, growth picks-up, flowering and fruiting continuing during August–November month under hot arid climate.

For early fruit harvest (March) from established plantation, cut-down surface area (50 cm wide) is covered with transparent polythene-sheet in December-January when temperature dips-down (below 9°C at night). This technique permits early re-sprouting in plants from second week of January under protection and it is three weeks advanced. After this, covering material is removed and upright vines grow faster.

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