



Zucchini (*Cucurbita pepo* L.) Cultivation in India: A Review

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ABSTRACT

Background: Zucchini (*Cucurbita pepo* L.) belong to the family Cucurbitaceae and is an exotic crop grown in both open field and protected conditions. It is recently been popularized in India due to yield and health benefits and grown in various climatic and soil conditions.

Methods: This crop is raised initially in polybags in Jorhat and Darrang of Assam and then transplanted in polythene mulched field conditions. It is grown from March-April in mild summers of North India and grows from September to December in lower hills or plains according to package of practice.

Result: Various location specific spacing and fertilizers are incorporated in this crop and growth regulators like Ethrel are incorporated to promote the number of female flowers. This crop can provide huge income revenue if exported in near future.

Key words: Cucurbitaceae, Ethrel, Mulch, Polybags.

Zucchini (*Cucurbita pepo* L.) or summer squash is an exotic vegetable which has recently been popularized in India. It is also called as Vegetable Marrow, Field Pumpkin in various regions of the world. Zucchini which belongs to family Cucurbitaceae is a quick growing and high yielding cucurbit which is suitable for production throughout India. It was originated in America and north-eastern Mexico and is considered as the only annual Bush type cucurbit in the world for human consumption. The plant has trailing habit and shortened internodes and can set fruits in closed succession. Fruits are botanically called Pepo and can be harvested in 50-60 days after sowing. Zucchini is mostly monoecious but there are instances of androecious mutants (Mukunda *et al.*).

Zucchini has various health benefits to human as well as medicinal potentials (Mohammad *et al.*, 2011). Zucchini is considered to one of the low calorie vegetable (17 Kcal per 100 gm) and doesn't contain saturated fats or cholesterol and its peel is considered an excellent source of fibre which prevents colon cancers and manage symptoms of diabetes and protect heart health, beside it helps to prevent inflammatory conditions. Fresh fruits provide Vitamin-A upto 200 IU per 100 gm a significant amounts of vitamins C, E and B6, niacin and thiamin, as well as minerals, in terms potassium, magnesium, phosphorus, calcium, iron and manganese. Golden Skin types are rich in flavanoids, antioxidants such as carotenes, lutein and zeaxanthins.

Zucchini cultivation was done under Jorhat and Darrang of Assam conditions. Zucchini is grown in wide range of climatic conditions across India and temperature can affect the percentage and the rate of germination. Base temperature for summer squash (*Cucurbita pepo* L.) is 10°C

while maximum growth is gained between 20°C to 25°C and ceiling temperature is 32°C summer squash requires cooler temperature at night than during day (Mohammad Bannayan *et al.*, 2011).

It is cultivated in wide range of soil but thrives best in well drained fertile sandy loam soil (Bielinski *et al.*, 2006). Soil must be rich in organic matter and good drainage facilities must be present in the fields. Early sowings are done on light soils and late sowings are favored in heavier soils (Ng'etich *et al.* 2013).

Seeds are sown in polybags or nursery raised and is transplanted to main field at 15-20 days after sowing (Narke *et al.* 2015). Rapid germination and vigorous growth occurs when soil temperature reaches from 28 to 32°C (Castro *et al.*, 2011). Zucchini is sown in black polythene mulch which reduces the incidence of weeds in the fields (Kostoval *et al.* 2014). Seed rate of approximately 1-1.25 kg per acre is used for sowing and optimum spacing is maintained among plants (Karde *et al.*, 2014).

In North India where summers are mild especially in hills sowing is done from March- April and crop matures in May-June (Panse *et al.* 1985).

In lower hills sowing is confined to later September and continues up to December (Hamad *et al.*, 2010). In North East Plains sowing is mainly confined to November and continues up to January. Summer squash variety Cora F1 planted in mid February gave the highest yield followed by Chungma Zucchini under the low hill conditions (Dev 2011). Varieties like cora, cheongma zucchini, champion, ASV- 3098, long green, golden yellow, yellow zucchini, green star, sunny house and catherina can be easily grown as offseason field cultivation in the Tarai regions of Uttarakhand (Maurya *et al.*, 2017).

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Spacing in crop production provides adequate sunlight, water and fertilizers between plants and weeds. Therefore it influences the crops directly and indirectly on better vegetative growth, higher yield, good quality of fruits and higher net returns. Higher cost benefit ratio (1: 3.70) was recorded at 1.2×1.2 m spacing level in under open field condition and polyhouse conditions (Mukunda *et al.*, 2019). In Konkan regions of Maharashtra, 60 cm \times 60 cm spacing was the best treatment for the production of Zucchini (Hem Lata *et al.*, 2017).

It influences the growth yield and quality of horticultural crops particularly on characters like colour, shape, size, taste, shelf life and processing. In a field experiment conducted in Konkan regions of Maharashtra, use of 150 kg /ha Nitrogen, 50 kg ha-each Phosphorus and Potassium were incorporated. Phosphorus and Potassium are used as basal dose and nitrogen was applied in two splits *i.e.* 20 and 40 days after first dose (Hem Lata *et al.*, 2017). Potassium foliar application increased the number of pistillate flowers, as well as yield and fruit quality (Mohammed *et al.* 2011 and Fekry *et al.* 2016).

In summer squash (*Cucurbita pepo* L.) cv. Punjab Chappan Kaddu, application of (50% of the recommended dose of chemical fertilizer + Vermi-compost@ 15t/ha) the highest gross return was observed due to maximum yield per plant, yield per plot, yield per hectare. With the application of 50% of the recommended dose of chemical fertilizers + FYM @ 25t/ha and 25% of the recommended dose chemical fertilizer + FYM @ 25t/ha has been found the highest net returns and Benefit: cost was observed.

Use of (20-20-20) NPK balanced or Nano fertilizer helps in improvement of vegetative and fruiting characteristics of the yield. There were no significant differences between this treatment and 100% mineral nitrogen fertilization treatment regarding to plant growth, mean fruit weight and early yield parameters. But it comes in the second significant grade as for total yield parameters after 100% mineral nitrogen fertilization treatment. Vegetative growth was also found to be highest on application of 5 mM concentration of salicylic acid.

Increase in vegetative growth, leaves nitrogen content, number of female flowers, yield, as well as the physical and chemical quality of fruits can be seen when spraying squash plants with Ethrel (250 ppm) once at the two immature leaves. Highest values of total chlorophyll, phosphorus and potassium percentage of leaves were recorded by spraying Ethrel at the age of two true leaves. Foliar spray of it had a positive effect on flowering behavior by increasing the number of female flowers in various cucurbits plants, where it more specifically in reversal the flowers from male to female (Kanawar *et al.*, 1993).

Surface and subsurface drip on summer squash production in the sandy soils. Applying the nitrogen fertilizers through two irrigation methods (surface and subsurface drip irrigation) was more efficiency than broadcasting fertilizers. Subsurface drip irrigation has the best water distribution in the soil. The highest value of fertilizer use efficiency (35.60 kg)

yield/kg nitrogen was obtained. There are a slightly increase in crop growth, fresh yield and both of water and nitrogen use efficiency in subsurface drip more than in surface drip. (Ghany *et al.*, 2009).

Zucchini crop is prone to fruit fly, white fly, aphids in open field conditions. Yellow sticky traps and pheromone lures traps can be used for reducing the pest incidence in open field conditions.

For better quality fruits are harvested at right stage *i.e.* when they reach 4 to 6 inches in length. First picking is usually done from 40-50 days after sowing and harvesting must be done before the rind begins to harden. It needs to pick every second day to maintain desirable fruit size because fruits become too large and stimulates further fruit set.

CONCLUSION

Zucchini has a huge export potential among vegetable crops due to its popularity in the western countries. But lack of research and extension facilities of this crop, the popularity and importance is scattered to some regions in India only. So by standardizing the package of practice of Zucchini will provide a tremendous scope for Vegetable growers of our country and will generate high revenue in near future.

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