

# Arka Veera: High Yielding, Good Quality and Downy Mildew Tolerant Indian Slicing Cucumber Variety Boosting The Farmers' Income in Karnataka

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## Arka Veera

Indian slicing cucumber (*Cucumis sativus* L.) is one of the most important cucurbitaceous crop, grown around the world. "Arka Veera" is an open-pollinated variety, having cylindrical smooth fruits, green with light green stripes on the blossom, free from internal core split and bitter taste. The variety is early flowering and it takes 27-34 days for the first female flower open. The yield ranges from 25-30 t/ha, tolerant to downy mildew disease and suitable for round-the-year cultivation. It is rich in minerals like potassium and Calcium. Immature fruits are good for people suffering from constipation, jaundice and indigestion. The variety is preferred for use of cosmetic, processing and health care industries. It is mainly cultivated by many small and marginal farmers for regular income. It is well adopted in states like Karnataka, Tamil Nadu, Telengana, Andhra Pradesh, Kerala Odisha and other North Eastern Regions. It is being tested at 14 centers under All India Co-ordinated Research Project on Vegetable Crops as well as five centers each of UHS Bagalkot and UAHS, Shivamogga for multi-location testing (MLT). It is very much suitable for precision farming (Drip Irrigation, mulching and fertigation) systems to get maximum yield and economic benefit to the farmers. Arka Veera seeds were produced through the seed village concept, so far produced 66.5 kg of seeds and sold around 57 kgs covered approximately 43.87 acres in the country. Many Karnataka farmers were cultivated this variety and realized the net profit of Rs.3-3.50 lakhs per 1.25 acres land and being open pollinated variety farmers can produce their own seeds with minimum isolation distance and save the seed cost. Arka Veera is already registered with PPV&FRA, New Delhi by ICAR-IIHR, Bengaluru for further protection.

## Soil

It is grown on sandy to clay soils but due to its well-developed tap root system, however, relatively light, well-drained soils are ideal. As such, loose, friable well manured loamy soils are desirable. A pH of 6.0-6.5 is ideally suited for cucumber cultivation. All soils need to be pulverized, moistened and enriched with organic matter before sowing. Crop requires moderately warm temperatures (18-24 °C).

### Salient features of Cucumber Cv. Arka Veera

- Early flowering and female flower at 3rd node
- Takes 27-34 days for the appearance first female flower and 42-45 days for the first picking of fruits
- Green with light green colour , cylindrical fruit , smooth free from internal core split and bitter taste
- Nutritionally rich in antioxidant activity and minerals like, Calcium, potassium Magnesium and zinc
- Yields 28.51 t/ha in 90-100days duration
- Tolerant to downy mildew disease



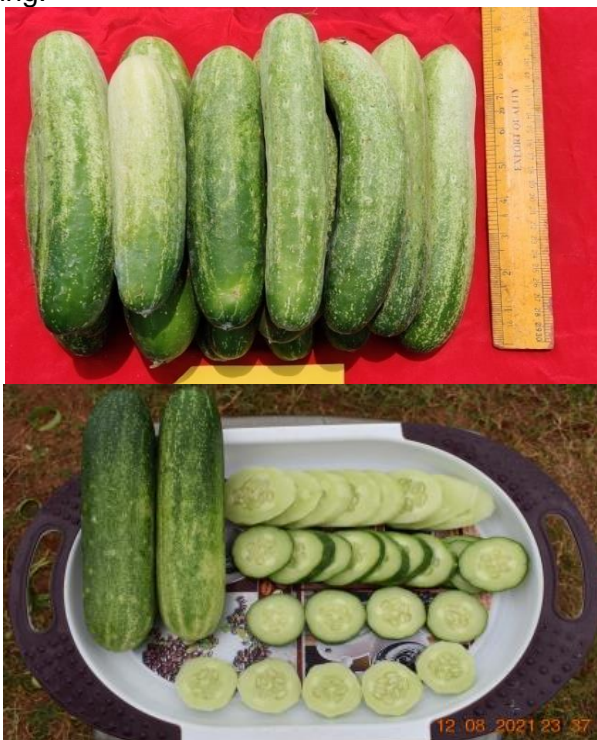
### Land preparation

Bring the soil to a fine tilth after 2-3 ploughing and harrowing. Level the land with a leveller. Incorporate well rotten FYM @ 25 tonnes per hectare (10 tonnes/acre) to improve the soil texture and aeration. Prepare ridges and furrows spaced 1.5m row to row and 60 cm plant to plant.

### Nursery raising

**Pro-tray method:** Trays are filled with microbial-enriched coco peat and raise seedlings in a protected structure. Seedlings can be drenched with Bavistin (2g/ L of water) or captan (3g/ L of water) on the 10th day after sowing as a precautionary measure against damping off. Seedlings will be ready (with one true leaf) for transplanting by 12-14 days after sowing

**Direct seed sowing:** If sure about germination, direct sowing will give harvest 7-10 days in advance. But better to have a few portray grown seedlings (sown one week in advance) for gap filling.



### Seed rate

350 grams of seeds are required per hectare and 135-140 g seeds per acres

### Seed Treatment

Cucumber seeds are treated with 2%  $KNO_3$  at 20°C for 6 days to improve the seed germination (40% more) during the cold season.

### Seedling requirement

11,111Plans / ha spacing of row to row 1.5 m and plant to plant 60 cm distance.

### Sowing time

1. Kharif season (June-July)
2. Rabi Season (September-October)
3. Summer Season (February-March)

### Manures and Fertilizers

Source	Per hectare
Organic manures	25 tonnes FYM
Nitrogen	60kg (95kg Ammonium Sulphate/ 74kg CAN)
Phosphoric acid	50 kg (107 kg Super phosphate)
Potash	80 kg (66 kg Muriate of potash)

**Application:** Incorporate 25t of FYM per hectare and apply neemcake @250 kg / ha before final bed preparation as a basal dose. Open up a deep narrow furrow on one side of each sowing ridge. Apply the fertilizer mixture containing 50 per cent nitrogen, a full dose of phosphorous and potash, mix well in these furrows cover the fertilizers with soil and irrigate.

**Foliar nutrition:** About 30-35 days after transplanting during flowering, 2-3 sprays at weekly intervals of borax @25ppm (25mg/L) along with 19:19:19 @ 4g/L will improve fruit set. At the fruit set and developmental stage, about 50-55 days after transplanting spray of a micronutrient formulation developed by ICAR-IIHR, Arka Vegetable special @ 4g/ L at 15 days interval will help in improve the yield and quality of the fruit.

### Fertigation Schedules:

Crop Stages	Duration in days	Fertilizer grade	Total fertilizer (Kg/ha)
Crop establishment	10	19:19:19+MN	19.72
		13:0:45	8.24
		Urea	22.1
Vegetative stage	20	12-61-0	9.21
		13:0:45	49.50
		Urea	95.27
Flowering initiation	20	19:19:19+MN	30
		13:0:45	21
		Urea	80
Harvesting stage	40	19:19:19+MN	7
		13:0:45	66
		Urea	77.50

Water soluble fertilizers require for a hectare of cucumber crop are 55 kg 19:19:19; 144 kg 13:0:45; 9 kg 12:61:0 and 275 kg of Urea.

### Irrigation

Irrigate the field two days before planting. Proper soil moisture should be maintained and over-irrigation should be avoided. Irrigate once in 4-5 days depending up on the soil and weather conditions.

### Intercultural operations

Remove cotyledonary leaves 20-25 days after transplanting, it helps in check the disease spread. Vine guiding / training may also be done when the plants start vining (35-40 days after sowing) for facilitating intercultural operations.

The plants should be provided suitable support made of iron angles, bamboo or wooden poles particularly in the rainy season to check the incidence of fruit fly and fruit rotting.

**Thinning of plants:** Thin out the closely germinated plants at one true leaf stage

**Weed control:** Proper weed management in cucumber could save up to 90 % of crop losses due to weeds. A total of 3-4 weeding starting from 20 days after sowing are required till the crop covers on the soil surface.

**Top dressing:** Apply the remaining 50 % nitrogen at the base of each channel 30 days after sowing followed by earthing up

### Integrated Pest and Disease Management Strategies

- Spray organic 3G (Garlic, Chilli and Ginger) extracts 20 ml/lit of water during morning and late evening hours to control sucking pests of Aphids and Jassids.
- To control aphids spray Confidor super (0.3 ml)/Pegasus (0.3 ml)
- To control mites at an early stage Spray Ecomite (1 ml)/ Pegasus (0.3 ml)
- At the time of three leaf stage remove cotyledanary leaves which are infected with leaf minor and spray Triazophos (2 ml), Triazophos + Deltamethrin (Jadu, scoop, punch) (2ml), Abacin (1ml/L)
- Spray Regent (1.3 ml) / Spinosad (0.5 ml) to manage thrips
- To manage red pumpkin beetle Spray Acephate (lancer) (2 gm)/ Marshal (2 gm)
- Collect and destroy the borer infested fruit along with borer, spray Fame (0.3 ml)/ Proclaim (0.3 gm) to manage fruit borer.
- Install blue and yellow sticky traps to minimize the sucking pest infestation.
- **Fruit fly:** Regular removal and destruction of affected fruits (by burying them in the soil) is essential, erecting culure trap/barix /vegetable trap 6-8 per acre will bring down the male fly population. Spray Neem soap (3-5ml) at 4 days interval. In 10 liter of water add jaggery (1kg) + Deltamethrin (20 ml) mix well and sprinkle on the plants using a broom/brush. Avoid delay in harvest and do not leave ripened fruits on the plants. Phenthoate (50 % EC) spray on the border of the field.
- **Damping-off of seedlings:** Drenched with copper-oxy-chloride or Copper hydroxide (2g/L) on 10th day after sowing.
- **Downy mildew:** Spray Ridomyl Gold (2gm),Cabriotop (1-1.5gm), Curzate (2 gm), Lurit (1gm), Aliete (1gm)
- **Powdery mildew:** Score (1.5 ml), Luna expreince (1ml), Cabriotop (1-1.5 gm), Natio (1ml)/ Roko (2g)+Biojodi (5g)/ Sprint (2g)+Biojodi (5g) as spray will help to control the disease
- **Anthracoise:** Spray Antracol (1.5-2 gm)/Folicure (1 ml)/Score (1.5 ml)

- **Fusarium wilt:** Carbendazim (1.5-2 gm) as drenching, Folicure/ Score (1ml) as spray

### Harvesting and yield

Harvest is done when the fruits are ready at a marketable stage. Delay in harvesting causes the fruit to become unfit for marketing. The average yield is 28.51t/ha (Table 1).

**Table-1: Mean performance of cucumber open pollinated variety Arka Veera**

S.N	Characters	Seasons		
		Kharif	Summer	Rabi
1.	Earliness (Days)	33.00	31	34.6
2.	No.of branches	4.33	3.8	3.5
3.	Plant height (m)	3.50	2.50	3.0
4.	Fruit length (cm)	22.07	21.00	20.37
5.	Fruit Diameter (cm)	4.30	4.00	4.02
6.	Fruit weight (g)	185.80	202.51	200.00
7.	Fruit colour	Green with light green	Green with light green	Green with light green
8.	Yield (t/ha)	31.66	28.99	26.86
9.	No.of fruits per plant	15.0	14.50	14.10
10.	Incidences of powdery mildew	Susceptible	Tolerant	Tolerant
11.	Incidence of downy mildew	Tolerant	Tolerant	Tolerant

### Farmers' feedback



- Mrs. Sushmitha and Mr. Madhu from Ancharahalli village showcased their successful cultivation of Cucumber Var. Arka Veera, emphasizing its high yield potential (25-30 t/ha), superior fruit quality and ease of management. The farmers also noted that Arka Veera fetches a premium price in the market earning Rs. 17 per kg and net profit of Rs. 3,50,000 making it a preferred choice for

other farmers and is suitable for year-round cultivation, offering flexibility in production cycles.

- Mrs. Varalakshmi and Mr. Srinivas family cultivated at 1.25 acre of Arka Veera variety, they were conducted demonstration at their field at Bettenahalli. They witnessed the strong performance of Arka Veera cucumber. they obtained 30 t/1.25 acres, Gross return Rs.3,90,000 (@ Rs.13 per kg), Cost of cultivation is Rs.80,000 and net profit Rs. 3,10,000/= . Farmer felt happy to cultivate this variety(Enhanced income security, improved savings, reinvestment into farm assets) Farmers, extension personnel, and local stakeholders were participated



#### **Future suggestions**

Arka Veera is an open pollinated cucumber variety, enabling farmers to produce the seeds themselves by selfing or following the 1000 m isolation distance from any other variety of cucumber to maintain genetic purity of the variety.