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Bottle gourd and its importance to humans

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INTRODUCTION

Among all the foods we eat, vegetables are important for maintaining a healthy diet and providing essential nutrients that support overall well-being. They provide vital nutrients and minerals required for health. Hence, they are known as protective food materials and play a key role in nutrition therapy, in treating chronic diseases like diabetes, cancer, and obesity. India is the second-largest producer of vegetables in the world. Nearly 10,000 plant species worldwide are used as vegetables. Among all vegetable families, the Cucurbitaceae family is the second largest family after the Solanaceae family. The Cucurbitaceae family consists of 95 genera with 965 species. *Cucurbita, Cyclanthera, Lagenaria, Citrullus, Momordica,* and *Luffa genera* are vital to humans. Lagenaria comprises *abyssinica, breviflora, siceraria, rufa, guineensis,* and *sphaerica* species.

Life stages of bottle gourd


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i) Seed germination occurs at 5 to 7 DAS (Daya After Sowing)

ii) Seedling emerged at 7 to 14 DAS

iii) Vining starts at 14 DAE (Days After Emergence)

iv) Vegetative stage up to 38 from DAS

v) Flowering starts at 40 to 50 DAS

vi) Flowering period at 50 to 65 DAS

vii) Fruiting stage at 65 to 90 DAS

viii) Fruits are ready to harvest at 70 to 90 DAS

Current status of bottle gourd in India

In India, bottle gourd is grown in all the states with warmer climates. It is cultivated in an area of 186,000 ha and production of 3052000 MT (NHB, 2018). Bihar occupies the first position in production, contributing about 20.86 per cent to total production (NHB, 2021).

S.NO	States	2023	2022	2021
1	Andhra Pradesh	0.466	0.422	1.78
2	Telangana	0.691	1.076	1.403
3	Puducherry	0.025	0.025	0.025
4	Punjab	13.805	12.336	10.565
5	Rajasthan	3.787	4.982	5.009
6	Sikkim	0.728	0.727	0.725
7	Bihar	44.488	44.161	44.161
8	Delhi	0.934	0.925	0.932
9	Jammu and Kashmir	2.293	2.292	1.006
10	Jharkhand	4.605	4.474	2.055
11	Odisha	10.63	10.63	10.6
12	Chhattisgarh	14.696	14.55	14.51
13	Nagaland	0.105	0.103	0.103
14	Karnataka	1.039	1.522	1.114
15	Madhya Pradesh	28.418	26.325	24.791
16	Meghalaya	0.799	0.769	0.764
17	Tamil Nadu	2.657	3.061	5.201
18	Tripura	3.513	2.517	2.278
19	Uttar Pradesh	17.428	16.808	16.395

Source- https://www.ceicdata.com/en/india/area-of-horticulture-crops-in-major-states-vegetables-bottle-gourd/area-horticulture-crops-vegetables-bottle-gourd-andhra-pradesh

Production from 2021 to 2022 (National Horticulture Board**)**			
S.NO	**States**	**Production (000 tons)**	**%Share**
1	Bihar	655.55	20.86
2	Uttar Pradesh	509.44	16.21
3	Madhya Pradesh	391.06	12.44
4	Haryana	351.18	11.17
5	Chattisgarh	261.43	8.32
6	West Bengal	200.57	6.38
7	Punjab	184.27	5.86
8	Odisha	146.04	4.65
9	Tamil Nadu	105.3	3.35
10	Assam	55.16	1.76
11	Maharashtra	55.1	1.75
12	Tripura	45.3	1.44
15	Jammu & Kashmir	25.29	0.8
17	Telangana	20.18	0.64
18	Karnataka	17.6	0.56
19	Meghalaya	9.5	0.3
20	Nagaland	0.83	0.03
21	Sikkim	0.21	0.01
22	Kerala	0.04	0
23	Others	18.46	0.59
	Total	3,142.71	

Source-
https://agriexchange.apeda.gov.in/India%20Production/India_Productions.aspx?hscode=1069

Requirements for the cultivation of bottle gourd (Dhatt et al., 2015)		
S.NO	**Practices**	**Recommendations**
1	Time of sowing	June-July
		November-December (Greenhouse)
		February-March
2	Place of growing	Central & south India have grown throughout the year under open conditions.
		North India grew in February-March and June-July.
3	Temperature	Germination is best at 25-30^{o} C
		Adversely affected below 15^{o}C and above 35^{o}C
		The day temperature for the growth of the plant is 25-35^{o}C
		Require warm season
		Sensitive to frost
		The mean annual temperature range is between 19-27 ^{O}C.

		The mean maximum Temperature of the Hottest months is 38°C
		The mean maximum temperature of the coldest months is 10°C
4	Rainfall	Mean annual rainfall range about 700-2800 mm
		The mean annual rainfall of the lower limit is 700 mm.
		The Mean annual rainfall of the upper limit is 2800 mm.
5	Elevation	Sea level to 2500 m
6	Soil type	Loamy to sandy loamy soils
		Drainage free
		Acidic to neutral
7	Soil ph.	6-7
8	Tillage	5-6 ploughing
		Fine tilth soil
9	Seed variety	-
10	Seed rate	3-6 kg/ha
11	Seed treatment	10 gm of *Pseudomonas fluorescens*/kg of seed
		4gm of *Trichoderma viridian* / kg of seeds
		Bavistin @ 0.2% or 3 gm/kg of seeds
		Soaking seeds in water for 24 hours ameliorates the germination.
12	Fertilizers	FYM is 20-25 tonnes/ha
		Nitrogen is 28 kg/acre.
		The first dose of nitrogen is 14 kg/acre given at the time of sowing.
		The second dose of nitrogen is 14 kg/acre given at the time of the first pickling.
		P2o5 is 25 kg/ha
		K_2o-25 kg/ha
13	Method of sowing	Flatbed (spring-summer)
		Raised bed (Rainy season)
		Ring/Basin method
		Furrow method
		Dibbling method
14	Spacing	2-2.5m (row)
		45-60cm (plant)
		The sowing depth is 1.2 cm deep.
		In the Dibbling method 2m-3m×1m-1.5
		In the pits, 2-3 seeds are sown at a depth of 2.5 cm -3cm deep.
		In the Furrow method, 2 seeds are sown on both sides of the furrow.
15	Irrigation	Drip irrigation
		First irrigation is given two days before sowing.

		Summer irrigation intervention of 3-4 days
16	Weeding	Fluchloralin 2kg/ha
		Alachlor 2.5 kg/ha
		Butachlor 2.5 kg/ha

Nutritional value of bottle gourd (Rahman, 2003)

100 gm. of the edible portion of bottle gourd contain		
Nutrients/Minerals/Vitamins	**Fruit (mg)**	**Seed(mg)**
Protein	620	24540
Total Lipids (Fat)	20	45850
Carbohydrate	3390	17810
Fibre	--	3900
Calcium	26	43
Iron	0.2	14.97
Magnesium	11	535
Phosphorus	13	1174
Potassium	150	807
Sodium	2	18
Zinc	0.026	7.46
Copper	0.066	1.39
Manganese	0.2	3.02
Ascorbic Acid	10.1	1.9
Thiamine	0.029	0.21
Riboflavin	0.022	0.32
Niacin	0.32	1.745
Pantothenic acid	0.152	0.339
Vitamin B-6	0.04	0.224
Choline	16.02	--
Tryptophan	3	431
Threonine	18	903
Isoleucine	33	1264
Leucine	36	2079
Lysine	21	1833
Methionine	4	551
Cystine	--	301
Phenylalanine	15	1222
Tyrosine	--	1019
Valine	27	1972
Arginine	14	4033

Histidine	4	681
Alanine	--	1158
Aspartic acid	--	2477
Glutamic acid	--	4315
Glycine	--	1796
Proline	--	996
Serine	--	1148

Uses of bottle gourd

Bottle gourd, *Lagenaria siceraria* (Molina) Standley is a multipurpose vegetable of the Cucurbitaceae family. It is native to Africa and India. Its tender fruits are consumed as fresh vegetables, whereas the dried fruits are used for storage jars, containers, bowls, musical instruments, and fishing floats. It is a low-calorie vegetable rich in vitamins and minerals and has cardiotonic, aphrodisiac, hepatoprotective, anti-inflammatory, and expectorant properties. Pulp of the fruit is used for treating conditions like stomach acidity, indigestion, ulcers, hair disorders, diabetes, hypertension and liver ailments. Its seed oil and seed poultice for treating throat infections. Plants of this gourd are used as rootstock for watermelons and pollens in the breeding of seedless watermelons.

CONCLUSION

Apart from the dietary requirements, bottle gourd also provides enormous benefits to humans. Nowadays for the treatment of chronic diseases, most people depend on a healthy diet and also for cosmetic beauty products rely entirely on products made from natural ingredients obtained from plants and among those bottle gourd in one. Hence it is important to focus on the bottle gourd production, utilization and value addition.


Storage jars


Bowls


Musical tool


Fishing floats

Cardiotonic


Hair serum

cooking oil

Aphrodisiac

Juice

Cooling oil

Pickle

Powder

Face cream

Products made from the Bottle gourd

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