



Chili Manual

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THANK YOU!

This is to formally thank to all those who are contributing their services, dedication, and assistance to SAWIE, and we are extremely grateful to all of you for this kind gesture. What we're doing couldn't have been possible without your guidance, intelligence, and enlightenment. We're eagerly looking forward to making this relationship stronger and stronger with every passing day, and your presence in this organization means the world to us.

SAWIE wishes you all the possible luck in every aspect of your life.

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Introduction:

- Chili is a cash crop and cultivated around the world. It is used as fresh vegetable, dried condiment and grounded powder for various culinary and medicinal purposes.
- It belongs to family Solanaceae and Genus *Capsicum*
- Chilies are commonly named: Chile, paprika, hot peppers, red peppers, and capsicum in different regions of the world
- Pakistan is among the top five chili producers in the world
- Chilies are rich source of vitamin A, C, E, and minerals like phosphorus, magnesium, and iron etc.
- Chilies are also used in many value added products like sauces, ketchup, and pickles
- In Pakistan, Sindh province accounts for 73% of the total cultivated area with Mirpur topping the list with 44% area
- Whereas 21% of the area lies in Punjab mainly concentrated in Multan, Bahawalpur, and Faisalabad divisions



Varieties of chili

- Ghotki:** This variety is grown in Ghotki, Khairpur, Shikarpur, and Kotri in February and March. Its fruits are thin, long straight with little quantity of seeds inside. Growers get a good price from this variety.
- Longi:** This variety is grown in Mirpurkhas, Nawabshah, and Tharparkar districts. Its nursery can be raised in January, February. It gives an average yield of 35-50 mounds per acre.
- Talhar:** it is grown in Badin, Talhar, and some areas of Hyderabad. This is a late variety, its nursery is raised in June, July and transplantation is done in

August. Fruits of this variety are long, thick-like fingers. Its yield potential is 80-100 mounds per acre.

- iv. **Sanam:** It is mostly grown in Karachi but is also grown successfully in Mirpurkhas and Hyderabad districts. This variety is grown well in both season's winter and summer. Its fruit is cylindrical and long. Gives an average yield of 100-150 mounds per acre.
- v. **Kunri:** It is commonly known as Longi Dandi Cut. It is produced in Kunri areas and has a unique taste, bright red color, round-tipped shape, and aroma.



Climate

- Chilies are warm climate crops. Its plants do not tolerate the cold and frost
- Chilies grow well in warm climates and require dry weather during maturity
- It may grow well in tropical and sub-tropical regions and tolerate heat
- Chilies can be grown over an altitude from sea level up to 2100 meters
- The optimum temperature for chilies growth is from 24°C to 32°C
- Temperature above 35°C along with dry wind may lead to fruit drop

Soil

- Chilies can be grown in well-drained clay loam to clay soils
- Waterlogged and alkali soils are not suitable for chilies production

Land preparation

- For successful cultivation of chilies, the soil must be leveled and smooth
- Chili roots go 6-8-inch-deep in the soil, so deep ploughing of the field is recommended



- Ploughing twice with mold board plow is recommended, leveling of soil should be done for proper distribution of fertilizers and water
- Well-rotted farmyard manure at the rate of 25-35 tons per acre should be added 1-1.5 before chilies transplantation
- After land preparation, 2.5 ft. wide ridges are prepared

Seed rate

- About 125-150 grams of healthy seeds are enough to produce a one-acre nursery of chilies

Sowing time

- Chili nursery is raised in plains areas during October-November and transplanted to the field in mid-February
- In mountainous areas, it is grown in January, February, and March
- Similarly, the nursery is transplanted in the field in April and May according to the severity of the weather

Nursery raising

- Nursery is raised in strips of one-meter-wide, and three-meter long
- Seeds are broadcasted into the soil and covered the seeds with a thin soil layer
- Then covered these ridges with straws layers and wooden sticks then apply water in the morning and evening until the seeds germinate
- When seeds germinate removed the straw and apply light water after every 1-2 days
- Seedlings are ready for transplanting within six weeks

Transplantation

- After land preparation, 2.5 ft. wide ridges are prepared
- Nursery is transplanted on outside of the ridges and maintained 1.5ft distance between each plant
- It is preferred to transplant the nursery in the evening because seedlings cannot bear noon temperature if transplanted in the morning
- Plant the nursery in a wet place, do not plant in water otherwise the risk of the diseases in chili is increased

Irrigation

- Chili crop should be irrigated immediately after transplantation followed by weekly irrigation in summer
- At least 2-3 irrigation should be applied within the first two weeks after transplantation for the establishment of seedling
- During the summer season (May-June) irrigation interval should be reduced to 4-5 days

- Irrigation interval may be increased after the onset of rains in July
- Irrigation is very important at the time of flowering and fruit development in chilies



Fertilizers application

- Well decompose manure should be incorporated in the soil at the rate of 8-10 tons per acre 40-50 days before planting the nursery
- Before transplantation fertilizers should be blended well into the soil at the rate of
 - 110-150 kg of phosphate per hectare
 - 45kg of nitrogen per hectare
 - 25-35kg of potash per hectare
- Nitrogenous fertilizers increase the vegetative growth and delays maturity in chilies therefore, large applications of nitrogen fertilizers should be avoided
- Two bags of DAP and one bag of SOP, before sowing is recommended
- Two to three bags of urea are recommended, 1/2bag is applied after 20 days of transplantation, one bag at the time of flowering, and later ½ to 1 bag after each picking

Weeding and earthing up

- Weeds should be removed regularly to get a good yield
- Weeds cause great loss to crops by competing for water, nutrients, fertilizers, and light
- Three to four Intercultural practices are recommended to control the weeds
- Earthing up at the flowering stage is recommended, it helps the growth and development of plant and also prevents plant lodging and protect from disease

Insects of chilies

- Various insect pests attack and damage the chili crop in different crop seasons

Aphid

- Also known as green plant lice because of their green color
- Attack the chili crop after 2-3 weeks of transplantation and at nursery stage
- Aphids suck the cell sap from the leaves and flowers of the crop
- Mostly attack in winter and later stages of crop
- Chili mosaic disease is transmitted by aphids to the other healthy plants and cause 20 to 30% yield loss

Control

- Attract the predators of aphids like hoverfly, crab spider, and ladybirds
- Imidacloprid 200 SL according 150-100 ml or dimethoate 40% EC according to 300 ml per litter of water
- If the chili crop is ready for picking, then used derris insecticide



Termites

- They are slightly yellow
- Attack on the plant roots and cause damage

Control

- Remove plant debris to protect the crop from termite's attack
- Intercultural practices can also minimize the attack of termites
- Chlorpyrifos 40% SC according to 1.5-2 litter or Fipronil 500 ml flooded in the field



Fruit borer

- Slightly green in color *Helicoverpa armigera* L.
- Larvae make circular holes in fruit and leaves
- Then they feed on the seeds of chilies with their head inside the pod
- It causes premature dropping of fruit and flower

Control

- Deep ploughing of the field during the summer season
- Bury the infected fruit into the soil up to the one-meter depth
- Spray a solution of karate 2CC in 1 liter of water



Diseases and their control

Anthracnose

- One of the most important diseases of chilies is caused by the fungus *Colletotrichum piperatum* L.
- It is promoted by warm temperature and high moisture
- This disease is characterized by round dark spots that are formed on the fruit of the infected plant
- Spots are usually circular, water-soaked, and have black margins
- It causes the premature drop of fruit resulting in loss of yield

Control

- Treat the seeds with fungicides such as Benlate or topsin-M at the rate of 2 grams per kilogram of seed before sowing
- A spray of captan or diathane M-45 at the rate of one kilogram per acre of the field should be done
- Crop rotation is also recommended



Phytophthora blight

- It is caused by the fungus *Phytophthora capsici* L.
- It is characterized by dark brown spots on the stem, expanding upward by the soil line followed by sudden wilt of the whole plant without yellowing of leaves
- At first, spots are light in color and later becomes dark
- The plant burns within 8-10 days of the onset of disease and then completely dries up in just a few days
- During the rainy season, this disease spread rapidly with rainy water

Control

- Cultivate the resistant varieties against the disease
- Chilies should not be grown on land where potatoes, eggplants, and tomatoes have been planted before
- Plants should be cultivated on ridges for better drainage
- Managed through crop rotation
- Before sowing, seed should be treated with ridomil or captan fungicides at the rate of 2 grams per kilogram of seed
- Soak the seeds in the above-mentioned fungicide solution for 10 minutes before transfer to the field



Chili leaf curl virus

- Whitefly cause the spread of the most viral diseases
- Its symptoms mostly appear in the form of curling of leaves and Smalling of leaves
- Chili leaf curl affect the plant by stunt growth with upward curling and yellowing of leaves
- The fruiting of a plant is reduced, if fruits are formed they become small and deformed
- These diseases cause damage from nursery to the whole plants

Control

- To control these insects spraying of Monitor or karate insecticides should be done
- Infected plants should be removed and buried away from the field



Damping-off

- This disease is caused by *Pythium aphanidermatum* L.
- It destroys young seedlings, especially decaying the stem of the plant near the soil base
- Cause 90% death of the plant both in the nursery and in the field

Control

- It can be controlled by planting healthy treated seeds in rows of well-drained beds at a distance of 4-6 inches



Dieback

- It is a fungal disease found globally a serious problem of chilies
- Appear at the blossoming stage of the crop and cause the necrosis of twigs from tips to backward
- Twigs become grayish-white or straw color in severe stages of diseases
- A large number of black dots are formed on the twigs of the infected plant

Control

- Use healthy and disease-free seeds for nursery raising

- Before transplantation seeds should be treated with *Trichoderma viride* at the rate of 10g per kilogram of seed



Harvesting

- Chilies should be picked when they are fully ripe and good in color
- The first picking of chilies is done at the end of June, while the second is in July-August
- Be careful while picking the chilies because the chili plant is very soft and delicate, so the plant does not break during fruit picking
- After picking the chilies should be spread on mats in a thin layer for drying to avoid any rotting
- At night chilies should be covered with polythene sheets to protect them from dew moisture
- Fruit moisture should be 70-75% at the time of picking that reduced to 8-10% after drying



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