

ONION

CLIMATE AND SEASON

Soil

- Onions are grown on nearly all types of soil, such as sandy loam, silt loam and heavy clay soils. However, it cannot be grown in Alkaline or low lying marshy soil.
- The best soil for successful cropping is deep friable loam and alluvial where free drainage, absence of persistent weeds and presence of organic matter favour its production.
- It is believed that onion matures early in day but yield is low.

Soil pH

- Onion prefers slightly acidic soil with pH ranging from 5.8 to 6.5.

Climatic requirement of onion

- Onion can be grown under a wide range of climatic conditions. However, it grows well under mild climate without extreme heat or cold or excessive rainfall.
- The plant is hardy and in the young stage can withstand freezing temperature.

Season

Kharif- May – June is best season for planting.

Rabi – October

SEED

Varieties - Bellary Red, Pusa Red, NP 53, Arka Niketan, Arka Kalyan, Arka Lalima, Arka Kirthiman, Arka Pitamber, Arka Kalyan, Agri Found Light Red Agri Found Dark Red and Rose onion (small) are commonly cultivated.

Seed Rate–4 Kgs per acre

Seed Treatment

- Treat the seeds with *Azospirillum* @ 400 g/kg of seed using rice gruel as adhesive, dry under shade for 30 minutes and sow them.
- Apply VAM 1 kg/sq. m in the beds along with ghanajeevamrutham before sowing.

LAND PREPARATION

- Plough the land till good tilth is obtained. After getting suitable and required tilth of soil, land should be perfectly levelled by using bullock drawn or tractor drawn levellers. Levelling helps in irrigating the fields with high water use efficiency. Also helps in draining excess water without stagnation and heavy rainy days or immediately after giving irrigation. During last plough add 2.5 Tons of NADEP compost (if available) 400 kgs of ghanajeevamrutham
- For Main Field, form ridges and furrows at 45 cm spacing or 15 cm which is practicing in some States

CROP ESTABLISHMENT

PLANTING METHOD

PLANTING BY BULBS METHOD

- To meet the demand of green onion for salad in early winter, planting of bulbs are practiced. Bulbs are dibbled 15 cm on the side of 45 cm ridges or in beds. There is also the practice of dibbling bulbs in furrows made with country plough and the field irrigated after forming beds and channels.
- To plant one hectare, 750 kg of medium sized bulbs are required. Large sized bulbs, if planted, tend to flower early and result in low yields. Medium sized bulbs obtained from a seedling - planted June crop can also be utilized for planting in October, after giving a month rest.
- In North India, bulbs from the previous harvest are planted in August or September. The secondary bulbs developing for the mother bulbs find a ready market as green onion early in the season i.e., during October to December.

TRANSPLANTING METHOD

- This method is followed for an irrigated crop and if large sized bulbs are required

Points to be considered

- Generally sandy loam soils are preferred for this purpose.
- In case of drainage problem. Onion seeds are raised in raised nursery bed. If not, sowing can be taken in flat beds.

- Nursery bed dimension is 7.5 m x 1.2 m x 10 cm
- Seeds should be sown at 4-5 cms apart
- During Kharif season, height of raised nursery bed should be around 15-20 cm in case of poor drainage and 30 cm wide channel is prepared all around the bed.
- The edges and tops of the bed should be quite firm.
- The top surface up to 2 - 3 cm should be enriched with ghanajeevamrutam before sowing.
- Seed should not be sown beyond 2- 3 cms deep
- After sowing, the seeds are covered with a fine layer of ghanajeevamrutham The beds are mulched with dry grass or straw to preserve the required soil moisture till the germination is completed.
- To protect young seedlings from heat of direct sun rays, partial shade should be provided.
- The damping off disease is very much prevalent during rainy season. To prevent, pre emergence damping off, seeds should be treated with Trichoderma viridi at the rate of 5 g/kg of seeds. To control post emergent damping off, drenching seedling with Trichoderma viridi/ pseudomonas @8gms/litre is recommended.
- In the presence of assured irrigation onion can be sown in all the three seasons, namely, monsoon crop (June to October). Winter crop (October to January) and summer crop (October to January).
- The seedlings are ready for transplanting after 6-7 weeks of sowing for Kharif planting and after 8 weeks for rabi planting.
- Beds should be irrigated before and after transplanting

PLANTING

Plant 45 days old seedlings at the spacing of 15 cm between rows and 10 cm between plants.

INTER CROPPING AND CROP ROTATION

Onion can also be grown as an intercrop in sugarcane field till the trenching and earthing up of the sugarcane, in the middle of turmeric and banana crops, in alleys of young fruit gardens, along borders of beds of finger millets. Onion can be used in the following cropping systems

Maize - potato- onion

Tomato-onion

SOIL FERTILITY MANAGEMENT

During last plough add 200kgs of ghanajeevamrutham 2.5 Tons of NADEP compost (if available)

Apply 200 KG of Ghanajeevamrutham while planting and

200 liters of Dhravajeevamrutham @ 15 days interval till maturity of crop

WEED MANAGEMENT

Mulching with suitable and available straw material to suppress the transplanting of bulbs

First weeding is done on 30th day after transplanting. Then weeding necessary.



WATER MANAGEMENT

Mulching with suitable and available straw material to conserve soil reducing the frequency of irrigation in irrigated system after transplanting of bulbs. After establishment irrigate at weekly intervals.

In general, it is recommended to take up 5 to 6 irrigations for June plant crop and 12 to 15 irrigations for October planted crop and 15-20 irrigations for summer crop.

PEST AND DISEASE MANAGEMENT

ONION THRIPS: *THRIPS TABACI* LINDEMAN

Damage/Symptoms

Both adult and larval thrips feed within the mesophyll layer using a punch-and suck motion.

The beak and mandible is thrust forward to puncture the leaf epidermis and sap released from injured plant cells is sucked up.

- Removal of chlorophyll causes the feeding area to appear white to silvery in color. Areas of leaf injury can occur as patches and streaks.
- When feeding injury is severe, leaves take on a silvery cast and can wither.
- Tiny black “tar” spots of thrips excrement are evident on leaves with heavy feeding injury.

Control Measures:

- Use resistant/tolerant varieties.

- Practice field sanitation.
- Avoid successive planting of onion or other preferred/alternate host such as cabbage, cotton, tomato, cucumber, melons, pumpkins, strawberries etc.
 - Plant the new crop in upwind direction of already planted crop which help in escaping infestation from old planting to some extent in the initial stages.
- Adjust the transplanting dates
- Arrange 15-20 blue sticky plates per acre
 - Use of sprinkler irrigation reduces thrips population considerably compared to drip and surface irrigation
 - Plant two rows of maize or inner row of wheat and outer row of maize surrounding the garlic plots as barrier crop (National Horticultural Mission 2012)
 - Spray neemastram/ nirgundi leaf extract



ONION MAGGOT: *DELIA ANTIQUA* MEIGEN

Damage/Symptoms

Larvae of seed corn maggots attack [germinating seedlings](#), feeds on the developing roots and epicotyl. Their damage is usually restricted to the very early seedling stage. Onion maggots inflict similar damage but can continue to feed on the [expanding bulb](#) during later stages of growth. This results in increased rot in bulbs held in storage.

Control Measures:

- Avoid close spacing while planting.
- Follow crop rotation.
Field sanitation.
- Conserve predators such as ground beetle, rove beetles, spiders etc. by providing grassy refuge strips



Onion Maggot

Spray Neemastram / vitex leaf extract to sterilize the eggs laid by the adult flies and Brahmastram/ agnastram to control the maggots

BULB MITE: *RHIZOGLYPHUS ROBINI* CLAPARÉDÈ

Damage/Symptoms

Bulb mites damage bulbs by penetrating the outer layer of tissue and allowing rotting organisms to gain entry. This pest is most damaging when plant growth is slowed by cool, wet weather. Bulb mites can reduce plant stands, stunt plant growth, and promote rot of bulbs in storage. On seeded onions, they can cut off the radicle before the plant becomes established.

Control Measures:

Avoid planting garlic after cole crops, as decaying cole crops, especially cauliflower, may harbor very high bulb mite populations in the field.

Avoid planting successive onion or garlic

Flood irrigation reduces mite levels in the soil.

In garlic, sow clean seed cloves. Spray as well as drenching around the plant of dung urine hing asafoetida extract

RED SPIDER MITE: *TETRANYCHUS CINNABARINUS*

Damage/Symptoms

Adults and nymphs feed primarily on the underside of the leaves.

The upper surface of the leaves becomes stippled with little dots that are the feeding punctures.

The mites tend to feed in “pockets” often near the midrib and veins.

Silk webbing produced by these mites is usually visible.

The leaves eventually become bleached and discolored and may fall off .

Control Measures:

A thorough water spray washes off the mites from the plant.

Spray dung urine hing extract

DAMPING OFF : *PYTHIUM* sp.

- Avoid excessive soil moisture.
- Follow crop rotation.
- Maintain proper drainage by leveling the land, and installing drains.
- Sow clean and healthy seed on raised beds.
- Over crowding of plants or dense sowing of garlic seeds should be avoided.

- Apply ghanajeevamrutham treated with *Trichoderma viridi*/ *Pseudomonas*
- Soil drenching of nursery beds with *Trichoderma viridi* solution (8 grams/litre of water)

ONION YELLOW DWARF: ONION YELLOW DWARF VIRUS

Damage/Symptoms

The onion yellow dwarf virus is a potyvirus that has a narrow host range (onions, garlic, shallots and a few ornamental alliums). It survives in bulbs and sets and therefore can be transmitted during vegetative reproduction. Although the virus is not spread to the seed, seed from infected plants is of poor quality. It can survive in volunteer onions. It is spread from plant to plant by the green peach aphid, *Myzus persicae*, and other aphids in a non persistent manner.

Control Measures:

- Manage the vector population by spraying neemastam / vitex leaf extract
- Plant virus free transplants.
Follow crop rotation of at least three years.
- Remove and destroy the diseased plants to check the spread of disease.
- Roguing of diseased plants and isolation from other susceptible crops or volunteer garlic
- Use blue sticky trap.
- Conserve the predators such as coccinellids, lacewings, spiders, wasps etc. for controlling thrips.
- tulasi leaf extract, datura leaf extract

Reference:

Manual Prepared by Rythu Sadhikara Samstha (RySS), Andhra Pradesh