

PRODUCTION TECHNOLOGIES OF CHILLI IN BIHAR

1. **Introduction.** Chilli (Botanically called *Capsicum annum* L; *Capsicum frutescene* L), also called red chilli belongs to the genus *Capsicum*, under the Solanaceae family. In general, the chillies are small sizes, pungent smelling whereas the less pungent type are capsicums. The pungency is due to active principle called Capsaicin contained in the skin and the Septa of the fruit. The red color of chillies is due to the presence pigment Capsanthin. Chillies are valued for their colour, smell and in addition to culinary use are used in medicine and beverages. Dry chilli, powdered or ground in to a paste and even green chillies are used every day in Indian kitchen for curries, samber, rasam and other savoury dishes to impart pungency, colour and flavour to food items. It is widely used in the manufacture of curry powder, curry paste and all kind of pickles and preparing sauces, soups, salads etc.
2. **Climate, Soil and Rainfall** Chilli crop is grown on altitude of 1500-2000 m. As a rainfed crop, chilli performs well in the region receiving rainfall of 60-120 cm spread over 4-5 months period. Area receiving less than 60 cm rainfall require a few protective irrigations for better crop yields. The chilli crop is susceptible to frost and requires warmer climate. The crop requires 4-5 months for complete maturity with an optimum temperature of 20-27 °C. Optimum temperature for fruit set is 24 °C. Night temperature below 10 °C restricts the fruit set. Fruit weight, length, girth and pericarp thickness were high at 25 °C day and 18 °C night temperature. Very high rainfall during its growth are harmful. When grown in hot weather or in lower rainfall tracts, it is cultivated as an irrigated crop. The winter crop is grown during July to September and the summer crop is in February- March. The chilli plants are for one season only. It is plucked 3-4 times in a season. The crop is ready in 3-4 months after planting and picking of ripe fruit continues for about 2 months. If there is a demand of green chilli, first 1-2 pickings are taken for the purpose. Summer crop is totally for green chilli. Ripe fruits are plucked with stalk and are kept 4-5 days indoor to develop red colour.

Chillies can be grown on all types of soils but well drained loam soil rich in organic matter is best suited for chilli cultivation. As a rainfed crop, chilli can be grown successfully in medium to heavy textured soils like clay and clay loams, provided proper drainage is there to prevent water stagnation. Chilli crop will not withstand water logged conditions for more than a day. A good crop of chilli can be raised on red sandy and sandy loam soils as an irrigated crop, with copious amount of organic manuring and fertilizer application. Though the chilli is grown on soils with a pH range of less than 5 to 8, but it performs best at a soil pH of about 6.5.

3. **Variety.**

Improved Variety: Arka Lohit, Pusa Sadabahar, Pusa Jawala, Pant C-1, Pant C-3, Krishana, NP 46-A, Punjab Lal, Jawahar-218 etc.

Variety for Pickle making: Arka Mohini, Arka Gaurav, Arka Basant, California Wonder, King of North, Bharat etc

Hybrid: Kashi Early, Kashi Surkh, Tejeswani, Agni Rekha, Kalyanpur Chaman, Kalyanpur Chamatkar, BSS-267, ARCH-228, etc.

Characteristics of some of the cultivars are given below:

Name of variety	Characteristics
Arka Lohit(Sel-1)	Fruits are dark green, smooth, straight, turn dark red at maturity, highly pungent; suitable for cultivation under irrigated and rain fed conditions; gives an average green fruit yield of 15 t/ha in 180 days of crop duration.
Pusa Sadabahar	Plants are erect, 60-80 cm tall, perennial and bear upright fruits. Fruits are 6-8 cm long, born in cluster (6-14 fruits/cluster) light green; turn dark red at maturity, highly pungent; resistant to CMV and leaf curl complexes. First picking starts on 75-80 days after transplanting (DAT); gives an average green fruit yield of 14 t/ha.
Pusa Jwala	Plants are dwarf, bushy and bear pendent fruits. Fruits are 10-12 cm long and slender, light green, highly pungent; tolerant to thrips and mites; suitable for dry fruit production; gives an average green fruit yield of 15 t/ha.
Kashi Anmol(KA-2)	Plants are determinate, bushy; bear green, attractive and pendant fruits. Nodal pigmentation on stems. First picking starts at about 55 days after transplanting(DAT); gives an average green fruit yield of 20 t/ha in 150-160 days of crop duration; promising for green fruit production under chilli- wheat cropping system.
Pant C-1	Plants are erect, 50-60 cm tall. Fruits are green when mature, turn red on ripening, fruits are erect 6-7 cm long, and surface is smooth with a blunt apex, highly pungent. Average yield of green fruits is around 8-9 t/ha.
Punjab Lal	Plants are dwarf, bushy with dark green leaves. Fruits are erect, medium size, dark green, turn dark red on maturity. Highly pungent; gives an average green fruit yield of 15 t/ha.
Arka Mohini	Fruits are dark green when mature, turn red on ripening, blocky, 3-4 lobbed, non pungent with pleasant aroma. Average yield 15-20 t/ha in 120 days after transplanting.
Arka Basant	Fruits are cream coloured with upright bearing habit, indeterminate plants. 3-4 lobbed, non pungent and good for stuffing. Average yield 15 t/ha in 125-140 days.
Arka Gaurau	Plants are indeterminate in growth with upright fruit bearing habit. Fruits are dark green at maturity and turn orange yellow on ripening blocking with 3-4 lobes. Flesh is thick, juicy, non-pungent having pleasant aroma. Green fruit yield is 15-20 t/ha in 125-150 days.
Bhagyalakshmi (G-4)	Plants are narrow with dark green leaves. Fruits are olive green, turn dark red on ripening, long (7-8 cm), fairly tolerant to disease and pests; gives an average fruit yield of 10 t/ha under irrigated and 6 t/ha under rain fed conditions.
Kiran(X-200)	Fruits are long, thin with light green pericarp turning light red colour on ripening. High pungency and fairly tolerant to thrips, mites and aphids. Average yield is about 9 t/ha.
Jwahaar -218	Fruits are 10-12 cm long, very pungent. Green fruits yield is 10-12 t/ha.

In addition certain hybrids suitable for Bihar condition are given below:

Name of hybrid	Characteristics
Kashi Early	Plants are tall (100-110 cm height) without nodal pigmentation on dull green stems and bear pendant fruits. Fruits are long (8-9 x 1.0-1.2 cm), attractive, dark green and turn bright red at physiological maturity, pungent with smooth surface. First picking of the green fruits starts at about 45 days after transplanting. The average yield of this hybrid is 25 t/ha (red ripe).
Kashi Surkh	Plants are semi determinate (100-120 m), erect and nodal pigmentation on stem. Fruits are light green, straight, length 11-12 cm, suitable for green as well as red fruit production. First harvest starts after 55 days of transplanting. Green fruit yield is 24 t/ha.
Tejaswani	Plants are bushy with 70-80 cm of height and bear pendant fruits. Fruits are dark green, turns dark red at the maturity, 9-11 cm long, highly pungent, suitable for green as well as red fruit production. First harvest starts 75-77 days after transplanting. Green fruit yield is 30 t/ha.

4. **Field Preparation.** Summer ploughing and stale seed bed preparation are very important to minimise the weeds and disease pest infestation. The soil is brought to a fine tilth by thoroughly ploughing the land 3-4 times followed by planking to level the field. Presently, laser land leveling is being undertaken by large number of farmers as it saves irrigation water(25-30%), increase input use efficiency and also enhances environmental quality and crop yield. Furthermore, adoption of furrow irrigated raised bed system (FIRB) will be of great relevance for chillies cultivation as it will save water and avoid water logging under Bihar situation. The main objects of tillage are
 - To prepare loose friable seed bed;
 - To destroy weeds and weed seeds;
 - To conserve soil moisture both for crop and soil micro-organisms;
 - To destroy disease, insect pests and disease causing organisms.
5. **Manure and fertilizers.** Chilli is being grown under rain fed as well as irrigated conditions. Application of 20- 25 t FYM or compost for one hectare during final plowing, before transplanting is common practice. 100-120kg N, 60-75kg P₂O₅ and 60-75kg K₂O per hectare recommended. Under irrigated condition, full dose of P₂O₅ and K₂O and 1/3 dose of N should be applied at the time of transplanting. The remaining 2/3 N is applied in two equal splits i.e. 5-6 weeks after transplanting at the time of earthing up and 8-10 weeks after transplanting. Under rainfed conditions, full dose of phosphorus and potash and half dose of nitrogen are usually applied two weeks after transplanting and the remaining nitrogen is top dressed after a month of first application.
6. **Nursery Raising.** As the saying goes 'As you sow , so you reap', thus planting of good healthy seedlings is one of the key factors for growing good crop of capsicum. Planting of good seedlings is the most important low cost input for getting higher yields. Good seed is prerequisite for raising healthy seedlings. Therefore, seeds should be collected from the healthy fruits of healthy plants. Higher seed germination is observed when seeds were collected from first picking. Storage of fruits for seed were better than extracted seeds. About 10-12 beds of 8×1.2×0.15m size are sufficient to raise seedling for one hectare. Nursery soil should be drenched with Formalin solution or with Captan 0.3% @ 5 lit. sol/m² for damping off control of seedling. After drenching, the bed should be covered with alkathene sheet for 48 hours then open for 48-72 hrs before sowing. 1-1.5kg seed is sufficient for one hectare. In nursery, seed should be sown at 2.5mm deep in rows spaced 5-7cm apart. Apply 15-20kg of well rotten FYM and 500g of 15:15:15 NPK fertilizer

during preparation of nursery bed. To ensure better germination, cover the beds with straw or dry grass till the germination is completed. Mulch should be removed after germination is completed, otherwise seedlings health will be affected. Then cover the nursery should be covered with 40 mesh nylon nets which will protect the seedlings from birds, rodents and virus carrying vectors. Regular light irrigation in the morning and evening with a rose can or micro sprinklers is suggested.

Seedlings in nursery should be raised for about 45 days. Clipping of seedlings about 10 days before transplanting will facilitate better seedlings establishment and better branching. Hardening of seedlings should be undertaken a week before transplanting by regulating water to the nursery.

7. Time of Nursery Sowing

- Main crop - June to August
- Summer season- January to February

8. Transplanting

- Main crop- July to September
- Summer season- January to February

Transplanting is done in the evening. The optimum spacing for main crop is 50×45cm while for summer 50×30 cm spacing is to be adopted. Immediate irrigation after transplanting facilitates better plant establishment. Thereafter, light and frequent irrigation should be given upto the establishment of plant. Double transplanting ie transplanting of chillies second time, 10 days after first transplanting, have following advantages

- Induced earliness in flowering and fruiting;
- Enhanced the yield by 25%;
- Extend the period of longevity of chillies.

9. Irrigation. Depends on soil type and season. Chilli plant cannot withstand water stagnation and excess moisture, hence light irrigation and proper drainage is recommended. As stated earlier in land preparation, adoption of FIRB system for transplanting is suggested, because it will not only save the irrigation water but will also increase the input use efficiency, yield and quality of environmental. Generally crop is irrigated at an interval of 5-6 days in summers and 9-10 days in winters. Sandy soils requires frequent irrigation than clay soils.

10. Inter culture and weed control. Gap filling is essential. It should be done in the evening hours followed by irrigation. Two to three hand weeding at 20 and 40 days after transplanting are essential. Nutralin @ 0.5-1.0kg/ha or Fluchlorin @0.5-1.0kg/ha pre plant incorporation before 10 days or Alachlor @2.5kg/ha pre transplant surface application give good control of weeds in chilli crop.

Mulch of any locally available material should be used. Advantage of mulches are

- Reduction or prevention of loss of soil moisture;
- Regulation of soil temperature;
- Reduced weeds and sometimes pest infestation;
- Improvement in the quality of fruits
- Organic material, when used as a mulch it increases the microbial activity in the soil.

11. Harvesting Green chillies are harvested after 60 days of transplanting and dry chillies are harvested after 90 days of transplanting. 5-6 picking is done for green chillies. 2-3 picking for red ripe fruits.

12. **Yield.** Normally, 1.5-2.0 t/ha dry chilli and 14.0-15.0 t/ha of green chilli are obtained. About 25-40% dry chilli recovery is obtained depending upon cultivars and thickness of the inner walls. The yield of capsicum is 20.0 t/ha and from hybrids yield up to 45 t/ha can be obtained.

13. **Physiological Disorder**

Blossom End Rot (BER):- Appearance of water soaked spots on blossom end of the fruit. Can be controlled by Supply light irrigation regularly and avoiding heavy application of N fertilizers. Adding lime to the soil or spray anhydrous calcium chloride.

Sun scald:- Soft, light colored and slightly wrinkled areas appear on the fruit surface. Can be controlled by Transplanting seedling at closer spacing and growing abundant foliage varieties and control defoliating insects.

Flower and fruit drop:- Occurs due to high temperature and low humidity, low light intensity, short day and high temperature. Can be controlled by providing light and frequent irrigation at flowering and fruit set stages and Spraying the crop either NAA 50 ppm or Tricentanol 2 ppm at full bloom stage.

14. **Insect and Pest:**

Name	Effect	Control
Thrips (<i>Scirtothrips dorsalis</i>)	The larvae and adult suck the sap of leaves, buds, flowers and cause curling of leaves.	Spray Dimethoate 0.03% or Endosulfan 0.05% at 15 days interval.
Aphid (<i>Aphis gossypii</i> , <i>Myzus persicae</i>):-	Suck cell sap from leaves.	Spray Methyl Demeton 0.025% or Dimethoate 0.03% .
White fly (<i>Bemisia tabaci</i>)	Suck cell sap and spread leaf curl disease	Spray Malathion 0.1% or Endosulfan 0.05%.
Fruit borer (<i>Spodoptera litura</i>)	Caterpillars feed gregariously on leaves and scrap them.	Spray Cypermethrin 0.05% or Carbaryl 0.02% at 15 days interval.

15. **Fungal Diseases.**

Disease	Control
Damping off (<i>Pythium aphanidermatum</i> , <i>Rhizoctonia solani</i> , <i>Fusarium spp.</i> , and <i>Phytophthora spp.</i>):-	1. seed treatment with Captan or Thiram @ 2g/kg seed. 2. Nursery bed treatment with Formalin. 3. Drenching nursery bed with mixture of Dithane M-45 0.25% and Bavistin 0.1%.
Ripe fruit rot, Dieback and Anthracnose (<i>Colletotrichum capsici</i>)	1. seed treatment with Thiram or Dithane M-45 @ 2g/kg seed. 2. Spray Dithane M-45 0.25% or Blitox 0.1% or Bavistin 0.1%.
Fruit rot (<i>Phytophthora capsici</i>)	1. seed treatment with Thiram or Dithane M-45 @ 2g/kg seed. 2. Spray Dithane M-45 0.25% or Blitox 0.1% or Bavistin 0.1%.
Powdery mildew (<i>Leveillula taurica</i>)	spray Karathane 0.2% at 15 days interval.

Leaf spot (<i>Cercospora capsici</i>)	1. seed treatment with Thiram @ 2g/kg seed. 2.Spray Bordeaux mixture 1% or Bavistin 0.1% at 15 days interval
Blight (<i>Alternaria solani</i>):- dark and leathery spots appear on the leaves and defoliation occur.	Spray Dithane M-45 (0.2%) and repeat after 10 days interval

15 Bacterial Diseases

Name	Symptoms	Control
Bacterial leaf spot (<i>Xanthomonas vesicatoria</i>)	Development of small dark and greasy spots on the leaves, petioles and stems and water soaked spots on the green fruits	1. Seed treatment with hot water at 50°C for 25 minutes. 2. Remove affected plant. 3. Destroy weed hosts. 4. Spray Streptomycin 200 ppm + Copper Oxychloride (0.03%) thrice during October – November at 15 days interval

16. Viral Diseases

Name	Symptoms	Control
Mosaic	Caused by Tobacco Mosaic Virus (TMV). Chlorosis, mottling, thickening of leaf veins, clustering of infected leaves and stunting of plants are observed. Virus is transmitted by aphids.	1. Grow tolerant varieties like Punjab Lal, Perennial etc. 2. Grow barrier crops like maize or amaranthus. 3. Spray Malathion 0.1% or Methyl Demeton 0.2% at 10 days interval

Package of Practices for Chili (*Capsicum Annum*)

Introduction

Chili is one of the most valuable crops of India. The crop is grown largely for its fruits all over the India. It is used in India as a principle ingredient of various curries, and chutneys. It is also used for vegetables, spices, condiments, sauces and pickles. Dry Chillies are used for curry powder. Red colour in chili is due to "Capsanthin". Pungency in Chillies is due to the active constituent "Capsaicin", an alkaloid, is extracted from Chillies and is used to medicine.

Climate and Soil Requirement for Chili or Capsicum Cultivation

Climate

The chili is a plant of tropical and sub -tropical region -It grows well in warm and humid climate and a temperature of 20 degree Celsius to 25 degree Celsius. Low moisture in soil during blossom development and fruit formation causes the bud, de-blossom and fruit drops. Excessive rainfall is detrimental to the crops, because it brings about defoliation and rotting of the plant. As a rainfed crop, it is grown in areas receiving an annual precipitation of 25-30 inches.

Soil and its Preparation

Chili can be grown in all type of soft but the sandy - loam, clay loam and loam soils are best suited for it, the soil must be well drained and well aerated. Acidic soils are not suitable for chili cultivation. Black soils which retain moisture for long periods are suitable for rain-fed crop whereas well drained chalka soils, deltaic soils and sandy loams are good under irrigated condition.

The land is prepared by giving 2-3 ploughings and clod crushing after each ploughing. Compost or FYM should be spread and mixed well in the soil at least 15-20 days before sowing. It is desirable to give neem cake @ 3-4 quintals per hectare at the time of land preparation. Restricted use of permitted mineral fertilizers under organic system can be done depending on requirement, based on soil analysis. Application of soil amendments such as tank silt, basic slag and gypsum is also allowed in a limited manner. Use of bio-fertilizers can also be resorted to the combination with organic inputs.

Sowing Time and Seed Rate

Season of sowing	Seed rate
January - February	Varieties: 1.0 kg / ha.
June - July	Hybrids: 200 - 250 g / ha. Nursery area: 100 sq.m
September- October	/ ha. (i.e 1% of the cultivable area)

Manures & Fertilizers

9 to 10 tones / hectare of FYM or compost is applied at the time of field preparation. In chilli for rained crop 50 kg N and 25 kg P should be applied 1/2 dose of N full dose of P applied at the time of transplanting. Remaining Yi dose of N applied 30 days after transplanting for .irrigated crop 100 kg N, 50kg P & 50 kg K should be applied per hectare. Fertilizers are applied in four equal doses. First applied at the time transplanting remaining doses are applied at 4th, 111 & 13' week after transplanting.

Improved Varieties of Chili or Capsicum

Improved varieties: N.P. 46, JwaJa, G-3, CA-960, Pant C-t X - 235, AKC - 79-18, Parbhani Tejas. Local: Achalpuri, Bhavapuri, Vashirn, Malkapuri.

Chilli: (Capsicum Annuum)

1. Agnirekha

It is a derivative of the cross Dondaicha x Iwala Released for green fruits by MPKV, Rahuri in 1992, for summer season. Further it is also recommended for cultivation by Project Directorate of Vegetable Research in 1996 for Zone VII. Plants tall and spreading, fruits long, bold, smooth and light green in colour. Duration is 180 days. Average yield of green" fruit is 250 quintals per hectare. Average yield of dry chilli is 27 quintals per hectare. (MPKV, Rahuri).

2. Musahvadi

Developed by selection from local collection of village Musahvadi, Dist. Ahmednagar (M.S.). It is released in 1988 by MPKV, Rahuri and also by the Central Sub Committee on Crop Standards, Notification and Varietal Release for Zones IV, V, VII and VIII in 1987 at the national level. Plants are tall, spreading habit with dark green foliage. Fruits are smooth and medium long. Mature fruits dark green with black patches, ripe fruits dark red with retentive colour. Duration is 180 days. It is tolerant to die back and wilt diseases. Average yield of red dry chilli fruits is 19 quintals per hectare. (MPKV, Rahuri).

3. Phule Jyoti

It is released in 1995 for kharif season. Plants are tall with spreading and branching habit from ground level. Leaves broad and dark green in colour. Fruits are smooth, medium long, borne in cluster of 5-6 with pendent habit. It is tolerant to thrips, mites and wilt. Average yield of green fruits 250 quintals per hectare and that of red dry fruits is 24 quintals per hectare. (MPKV, Rahuri).

4. Pbiile Sai

Developed by selection from the cross Pani C-l x Kamandalow. It has high yield potential under rain fed conditions. It retains the colour in storage for 6-7 months. It is moderately resistant to thrips and anthracnose (MPKV Rahuri). %. Phule.

5. Suryamukhi

It is released in 1996. Plants tall, spreading and branching habit from ground level, leaves broad and dark green. Fruits smooth, medium long, borne in cluster of 5-6 and upright erect. It is tolerant to thrips and wilt. Average yield of green fruits is 190 quintals per hectare and yield of red dry fruits is 22 quintals per hectare. (MPKV, Rahuri).

6. Phule Mukta

It is developed by employing pure line selection and released by MPKV Rahuri. It has dark green foliage, plants tall and medium spreading. Fruits are small, dark green and smooth. Ripe fruits are dark red in colour. Duration is 210 days. Resistant to powdery mildew and Fusarium wilt. It is tolerant to leaf curl, thrips and mites and resistant to lodging, suitable for both the kharif and summer seasons. Average yield of dry chilli is 23 quintals per hectare. MPKV, Rahuri).

7. Surkta

Surkta has been released for Vidarbha region both for the rain fed conditions of kharif season. It produces bright deep red fruits. Fruits are very hot in taste. It gives about 35 per cent higher fruit yield compared to variety CA-960. Yield of red ripe fruits is 68 quintals per hectare. (PDKV, Akola)

8. Jayanti

It is notified during the year 1996-97. It has been released for Vidarbha and at the national level under irrigated conditions. Plants are medium to tall in height with light green foliage. Fruits are medium to long in length (9-10 cm) with notch on 1/3rd portion from the tip of the fruit. Fruits are pale green, white — green and turn red on ripening. Yield of red ripe chilli is 18-20 quintals per hectare. (PDKV, Akola)

9. Parbhani Tejas

It is released in 1992 for Marathwada region for rain fed as well as irrigated conditions for green as well as red dry fruit production. It has pungency, fruits are longer (maximum 22 cm). Yield of dry red fruit is 18 quintals per hectare. Average yield on 20 farmers' field has been found 11.56 quintals per hectare as compared to 7.63 in case of NP-46. (MAU, Parbhani)

10. Kankan Kirti

Plants are dwarf with 50-60 cm height and dark green leaves. Dark green fruits turn red when mature, mild pungent. It yields 12-14 tones per hectare of green chilli. Fruits are dark green, lustrous, good keeping quality and good export potential. (BSKKV, Dapoli)

Seed treatment

Treat the seeds with *Trichoderma viride* @ 4 g / kg or *Pseudomonas fluorescens* @ 10 g/ kg and sow in lines spaced at 10 cm in raised nursery beds and cover with sand. Watering with rose can has to

be done daily. Drench the nursery with Copper oxychloride @ 2.5 g/l of water at 15 days interval against damping off disease. Apply Carbofuran 3 G at 10 g/sq.m. at sowing.

Nursery Raising

- For 1 hectare area 15 nursery beds of size 7.5m (24 ft) x 1.2m (4 ft) and raised 10cm (4 inches) are to be prepared.
- Apply 30kg FYM and ½ kg 15:15:15 complex fertilizer (NPK) to each bed and mix properly in the soil.
- Treat the seeds with organo mercurial compound @2g per kg of seeds and azospirillum (200g per kg of seeds) at the time of sowing.
- Sow the seeds in line at 7.5cm (3 inches) apart and cover with soil or FYM.
- Mulch the seed beds with paddy straw or any agricultural waste material, apply water through rose can and spray the beds with chloropyrifos @1ml per litre of water to avoid ants
- Water the nursery beds daily twice till germination and once after germination
- Remove the mulch immediately after initiation of germination.
- Ten days before transplanting reduce the quantity of water application to the nursery beds to harden the seedlings.
- Seedlings will be ready for transplanting at 45 days after sowing.

Layout & Spacing

Ridges and furrow type of layout is used. Seedlings are raised on raised bed. Spacing for rainfed crops is 60 x 45 cm & for irrigated crops is 60 x 60 cm.

Irrigation

Chili is grown both as rain fed and irrigated crop. First irrigation is given after the transplanting and subsequent irrigations are given 5-7 days' interval depending on weather and conditions of soil during summer and rainy season and after. Every 10 to 15 days in winter. The maintenance of uniform soil moisture is essential to prevent blossom and fruit drops. Bosso and Garibaldi (1971) reported that the irrigation when soil moisture tension exceeded one atmosphere increased the yield of the unshared plant, but the number of fruits was unaffected. Flower drop in Chillies is a great problem and it depends on the high temperature, low moisture availability, shading and light intensity. Flowers and /or flower bud abscission was increased under short day (day length 12 hours) and high temperature (28 °C to 33 °C). Spraying the Chili with Planofix (NAA) at 10 ppm at flower initiation stage and 15 days later (peak flowering) reduces the flower drop and increases the fruit set.

Intercultural Operations

2-3 shallow hoeing should be given to the soil to kill the weeds and provide soil mulch during early stages of growth- Application of weedicides for controlling the weeds is found effective. Lasso @ 1.5 litre per hectare with one hand weeding or Tok-E 25@ 2 litres per hectare with one hand weeding were effective in controlling the weeds.

Insect Pests of Chili

1) Chilli Thrips

Thrips is the common pest which effects the crop throughout its life cycle. But they are more severe when plants begin to flower. These small insects suck the sap from the foliage and lacerate the leaf tissue, which result in curling of leaves and fall of flowers prematurely.

Control Measures

Thrips can effectively be controlled by spraying carbaryl 50 W @ 3 gm or Zolene @ 3 ml or Dimethoate (Rogor 30 EC) or Monocrotophos (Monocil) tgi 1 ml per litre of water at fortnightly interval.

2) Pod Borer

The caterpillar eat leaves and later on bores the pod, which result in the deterioration of quality and market price of the product.

Control Measures

The control measures are timely spraying the crop with quinalphos (Exalux-25 EC) @ 4 ml or carbaryl 50 W, (Sevin 50 W) @ 3 gm per litre of water, starting from flower bud formation.

3) Aphids

Aphid suck the sap from the plants; they generally attack the crop in winter months and at the later stages of the crop. The quality of the produce is spoiled by imparting blackish colour to the Calyx and pods. They also serve as a vector for virus

Control Measures

The aphids can effectively be controlled by spraying the crop with Dimethoate (Rogor-30 EC) or Methyl Parathion (Metacid 50 EC) @ 1m (or Phosphamidon (Demicron-100 EC) @ 0.5 ml per litre of whiter.

Diseases of Chili

1) Damping Off

It is a serious disease of brinjal seedlings and mainly occurs in nursery bed. The disease infected seedlings rot at ground level and then the plants fall over ground. The seedlings die in patches.

Control Measures

1. The seed bed should be treated with Formalin before sowing of seeds.
2. The seeds should be treated without water (30 minutes at 520 C) or Cerasan or Agrosan G.N. before sowing of seed.
3. The seedlings in the nursery should be sprayed with any fungicides at a regular interval.

2) Bacterial Leaf Spot

Small dark, greasy spots are formed on leaf, petiole and tender parts, of the plant. Water soaked spots appear on green fruits. In severe cases the leaf may drop off and cause considerable loss to the crop.

Control Measures

Spraying Agrimycin - 100 k at 200 ppm plus copper oxychloride 0.3 per cent controls the disease effectively.

3) Anthracnose

Dark sunken spots are formed on fruits and pink or dark coloured dots appear in the centre of the sunken spots. Due to this spots, the fruits rot and fall. The fungus may cause "Die back" of the twigs also. Die back disease attacks mainly the upper portion of the plants spreading gradually from the top to downward; thus, the branches dry up. Moist weather, shade and heavy dew favour the occurrence of the disease.

Control Measures

The control measures are the treatment of seed with Cerasan before sowing, removing and burning of attacked plants or branches and spraying the disease affected crops with Mancozeb (Dithane M-45) @ 2.5 gm per litre of water.

4) Leaf Curl

The disease affected leaves become small accompanied by downward curling. The leaves may fall off in case of severe attack. The disease usually spreads through insect vectors such as thrips and aphids etc.

Control Measures

Control of insect vectors by spraying the crop with Dimethoate (Rogor -30 EC) or Monocrotophos (Monocil) @ 1 ml per litre of water indirectly helps to check the spread of this disease.

Harvesting

1. Chillies which are used for vegetable purposes are generally harvested while they are still green but full grown.
2. Chillies are harvested at red stage for canning purpose. Chillies used for drying are harvested at full ripe-stage.

Yield

The yield varies according to the system of cultivation. The yield of dry Chillies of rain fed crop is 200 - 400 kg and that of irrigated crop is 600 - 1000 kg per acre. The proportion of dry to fresh japed Chillies varies from 25- to 40 per cent.

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