

Maize (*Zea mays L.*)

Package of practices (*Kharif* and *Rabi*)

Maize is the most widely distributed cereal crop of India after rice and wheat. Of late, the economic importance of maize crop has been increasing because of its diversified agro-based industrial uses apart from its food, feed and fodder value. In Andhra Pradesh, maize is grown in an area of 9.72 lakh ha with a production of 48.13 lakh tons and productivity of 4951 kg/ha (2012-13). The following package of practices has to be adopted to achieve higher yields during *Kharif* and *Rabi*.

Soils: Red sandy loams to medium black soils with good drainage facilities are preferable. Maize does not come up well in saline, alkaline and waterlogged soils. The optimum pH range should be 6.5 to 7.5.

Time of sowing:

Kharif: June 15th to July 15th. In case of delayed monsoon, sowings may be extended up to first week of August using short duration hybrids under assured irrigation facilities.

Rabi: October 15th to November 15th in Telangana and Rayalseema districts and up to January 1st week in coastal districts of Andhra Pradesh.

Seed treatment: Seed treatment with Captan or Thiram or Mancozeb @ 3 g/kg of seed.

Seed rate: 7-8 kg per acre for normal hybrids, 3-4 kg per acre for sweet corn, 5 kg per acre for popcorn and 10 kg per acre for baby corn.

Spacing: 60 cm between rows and 20 cm between plants which gives an optimum plant population of 33,333 plants per acre and 75 x 20 cm spacing can also be taken up where the intercultivation operations are attended by tractor drawn implements which gives an optimum plant population of 26,666 plants per acre for all the hybrids and speciality corns except baby corn (45 x 20 cm).

Method of sowing: Sowing on sides of ridges at a distance of 1/3rd from top facilitates irrigation as well as drainage. Excess seedlings should be thinned 10 days after emergence to have single seedling per hill.

Fertilizers

For *Kharif* crop, a dose of 72-80 kg N, 24 kg P₂O₅, 20 kg K₂O per acre is recommended. Nitrogen may be applied in three splits i.e., at sowing, knee high stage and at flowering stages.

For *Rabi* crop, 80-100 kg N, 32 kg P₂O₅, 32 kg K₂O per acre is recommended. Nitrogen may be applied in four splits viz., at sowing, knee high stage (30-35 DAS), at flag leaf emergence (50-55 DAS) and at tasseling-silking stage (60-65 DAS).

In both seasons, 20 kg of commercial zinc sulphate per acre may be applied if soils are known to be deficient in available zinc. If symptoms appear later, the crop can be sprayed with 2 g/l solution of zinc sulphate.

Weeding

Pre-emergence spraying with Atrazine 50 W.P. @ 800 -1200 g/ac depending on soil type and at 30 days after sowing, spraying of 2,4-D Sodium salt 80 WP @ 500 g/ac in 200 litres of water will control most of the broad leaved weeds effectively. After 30-35

days, crop may be inter-cultivated and earthing up should be done. Atrazine is recommended when maize is grown as a pure crop only.

Irrigation

Though the crop is grown under rainfed conditions, if drought occurs during flowering stage, irrigation helps to give good yields. When the crop is in initial stages, provide proper drainage facilities to drain out excess water in case of heavy down pour.

Four to six irrigations are needed during the *Rabi* season. If six irrigations are given, they should be applied at the following crop growth stages. Two irrigations up to flowering at an interval of 20-25 days, one at the time of flowering, two after flowering and one at the early grain filling stage. If five irrigations are given, one irrigation at the vegetative stage may be avoided and if only four irrigations are given, one irrigation after the dough stage may be avoided. The irrigation schedule may however be changed suitably based on the soil conditions

Plant protection

a) Pests: The stem borer, *Chilo partellus* infests the crop during *Kharif* and pink borer *Sesamia inferens* infests during *rabi* season. The borers cause dead hearts in early stage of crop. The pest incidence is recognized by the presence of shot-holes in the leaf blades as well as exit-holes on the stem. To control the pest, prophylactic spraying of Monocrotophos 36 SC @ 1.6 ml/l or Coragen 0.3 ml/l when the crop is 10-12 days old and or application of Carbofuran 3 G in leaf whorls @ 3 kg/ac is recommended when the crop is 25-30 days old.

b) Diseases:

The important diseases of maize are leaf blight (*Exserohilum turcicum*), late wilt (*Cephalosporium maydis*) and charcoal rot (*Macrophomina phaseolina*). One to two sprayings of Mancozeb @ 2.5 g/l at 7-10 days interval starting from knee high stage of the crop controls the leaf blight. Banded leaf and sheath blight is observed in some of the districts and when the symptoms are noticed, stripping of the affected bottom 2-3 leaves along with their sheath and spraying of Propiconazole @ 1 ml/l is recommended. For late wilt & charcoal rot - crop rotation, removing plant debris, summer ploughing, avoiding moisture stress after flowering and growing tolerant hybrids should be followed.

Recommended hybrids/varieties

Hybrids:

Long duration (100-120 days): DHM 113, 900 M Gold, Bio 9681, Pro-311, 30 B 07, NK-30, NK 6240, SMH 3904, MCH 36 and JKMH 2492.

Medium duration (90-100 days): DHM 111, DHM 117, DHM-119, KH 510, Bio 9637, KH 9541, MCH 2, Kohinoor, Prabhal, Bisco 855, KMH 25K60 and JKMH 175

Short duration (<90 days): DHM 115, Prakash, KH 5991, JKMH 1701, DKC 7074 R, MMH 133 and Pioneer 3342

Speciality corn

Hybrids

Sweet corn: Sugar 75, Bright Gene

Popcorn: BPCH 6

Baby corn: HM 4, PEH-1, PEH-2, DHM 115

Quality protein: Amber Shakti, HQPM-1, HQPM-4, HQPM-5, HQPM-7, Vivek QPM 9

Varieties:

Sweet corn: Madhuri, Priya, Win Orange, Almora sweet corn.

Popcorn : Amber popcorn, Pearl popcorn, VL popcorn

Baby corn: VL 42, Him 123, Him 128, Him 129, Madhuri, Prakash, VL78,
VL Baby corn 1

Quality protein: Shakti 1, Shakti 7

Critical interventions:

- Maintaining optimum plant population of 33,333 plants/acre
- Plant protection measures against stem borer within 10-12 days after germination
- Keeping the crop weed free up to 45 days
- Top dressing of urea coinciding with the rains in *Kharif*
- Irrigation at silking, milky and dough stages

Zero tillage maize

- + No preparatory tillage
- + Dibble the seed after harvesting *Kharif* rice at 2-3 cm depth, in optimum moisture, or else, give light irrigation before dibbling depending on the soil type.
- + Practice Line-sowing by adopting a spacing of 60x20 cm
- + Spray Gramoxone 1.0 l/acre (5 ml /l) to prevent the regrowth of rice stubbles
- + Spray Atrazine 800g - 1.2 kg/acre (4 g/l) immediately after sowing or next day to prevent broad leaved weeds
- + Combination of Gramoxone 1.0 l/ac and Atrazine 1.0 kg/ac can also be used for controlling regrowth of rice stubbles and broad-leaved weeds.
- + Ensure proper moisture at the time of spraying herbicide
- + Intercultivation and earthing up to be practiced at 25-30 DAS

A recommended dose of 100-32-32 kg N-P₂O₅-K₂O per acre is applied. Entire Phosphorous as basal, nitrogen in four splits *viz.*, at sowing, knee high stage (30-35 DAS), at flag leaf emergence (50-55 DAS) and at tasseling-silking stage (60-65 DAS) and potassium in two splits *i.e.*, basal and flowering stage.

- + The fertilizers should be applied through placement method for better utilization of nutrients.
- + Provide 5-6 irrigations based on the soil type and climatic conditions
- + Adopt need based plant protection measures like normal maize.