MAIZE

1	Varieties along with recommend ed area	**Hybrids**: **Long duration** (100-120 days): DHM 113, 900 M Gold, 30 B 07, NK-30, Bio 9681, NK 6240, Pro-311, MCH 36, SMH 3904 and JKMH 2492. **Medium duration** (90-100 days): DHM 111, DHM 117, DHM 119, DHM 121, Kohinoor, Prabhal, Bisco 855, JKMH 175, Bio 9637, MCH 2, KH 510, KH 9541, KMH 25K60 and S 6217. **Short duration** (<90 days): DHM 115, Pioneer 3342, KH 5991, DKC 7074 R, JKMH 1701, MMH 133, Bio 605 and Sun Vaman. **Specialty corn**
		HybridsSweet corn: Sugar 75, Bright Gene **Popcorn:** BPCH 6 **Baby corn:** HM 4, DHM 115, Prakash, HIM 128, PEH-1 & PEH-2 **Quality protein:** 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 129, Madhuri, VL78, JH 3459 & VL Baby corn 1
2	Land preparation and Soils	One deep ploughing with mould board plough followed by ploughing with wooden plough twice or thrice in summer season. Before sowing, secondary tillage with cultivator to prepare smooth seed bed. Minor land smoothening before sowing helps in better insitu moisture conservation Red sandy loam and 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 5.5 to 7.5.
3	Seed treatment	Seed treatment with Captan or Mancozeb @ 3 g/kg of seed.
4	Sowing time	***Kharif*:** June 15th to July 15th **Rabi:** October 15th to November 15th **Summer:** 15th Jan to Feb 15th
5	Seed rate and Spacing	8 kg per acre for normal hybrids 4 kg per acre for sweet corn 5 kg per acre for popcorn 10 kg per acre for baby corn. Sowing on right side of ridges at a distance of 1/3rd from top facilitates pro perirrigation and drainage. Excess seedlings should be thinned out 10 days after emergence to have single seedling per hill. 60 cm between rows and 20 cm between plants which gives an optimum plant population of 33,333 plants per acre for all the hybrids and specialty corns except baby corn (45 x 20 cm)**.**

<table>
<tr><td>6</td><td>Fertilizer doses and time of application</td><td>FYM 10 t/acre
<table>
<tr><th rowspan="2">Type</th><th colspan="3">Kharif (Kg/acre)</th><th colspan="3">Rabi (Kg/acre)</th></tr>
<tr><th>Nitrogen</th><th>Phosphorous</th><th>Potash</th><th>Nitrogen</th><th>Phosphorous</th><th>Potash</th></tr>
<tr><td>Normal hybrids</td><td>80</td><td>25</td><td>20</td><td>100</td><td>35</td><td>35</td></tr>
<tr><td>Sweet corn</td><td>75</td><td>25</td><td>20</td><td>80</td><td>25</td><td>20</td></tr>
<tr><td>Pop corn</td><td>35</td><td>25</td><td>20</td><td>40</td><td>25</td><td>20</td></tr>
<tr><td>Baby corn</td><td>50</td><td>20</td><td>20</td><td>75</td><td>25</td><td>20</td></tr>
</table>
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). 20 kg of commercial zinc sulphate per acre</td></tr>
<tr><td></td><td></td><td>may be applied if soils are known to be deficient in available zinc. If deficient symptoms appear later, the crop can be sprayed with 0.2% (2g/l) solution of zinc sulphate.</td></tr>
<tr><td>7</td><td>Weed control (name of chemical and mechanical)</td><td>Pre-emergence spraying with Atrazine 50 W.P. @ 800g - 1.2 kg/acre depending on soil type effectively controls most of the broad leaved weeds for about 3-4 weeks. In intercropping system involving legume crops, pre-emergence application of pendimethalin 30% EC @ 1.0 l/acre in 200 lit of water is recommended. As post emergence application at 20-25 days of crop period or 4 leaf stage of weeds, spraying of Atrazine (same dose) or 2,4-D Sodium salt 80 WP @ 400g or Tembotrione @ 120 ml + Atrazine 400g or Halosufuron @ 40 g/acre in 200 lit of water will effectively control weeds. After 30-35 days, crop may be inter-cultivated and earthing up is done.</td></tr>
</table>

	Major disease and pest control	**Pests:Pink borer** (*Sesamia inferens*) infests the crop during *Rabi* season. The borers cause dead hearts in early stage of crop. The pest incidence is recognized by the presence of parallel holes in the leaf blades as well as exit holes on the stem. Generally hybrids are tolerant to these pests. In endemic areas, prophylactic spraying of Monocrotophos 36 SL @ 1.6 ml/l or Chlorantriniliprole 20 SC @ 0.3 ml/l when the crop is 10-12 days old and or application of Carbofuran 3 G in leaf whorls @ 3 kg/acre is recommended when the crop is 25-30 days old. **Fall Army Worm** (*Spodoptera frugiperda*) caterpillars feed mainly on leaves, munching on their edges and making holes giving them a ragged and torn appearance. Grown up caterpillars feed deep in the whorl, often concealed under their own frass. The leaves may be heavily damaged. If the growing point is destroyed, "dead heart" symptoms will appear. The larvae frequently feed on the immature kernels inside the developing ear. Control: * Egg masses and larvae should be hand picked and destroyed. Intercropping with legumes. Napier grass can be grown as trap crop Arrangement of pheromone traps @ 10 per acre. Releasing Trichogramma and Telenomus on crop. Spraying of 5% (5ml/l) neem oil to control egg masses and first instar larvae or spraying of chlorpyrifos 25 EC 400 ml or Quinolphos 25EC 400ml in 200 liters of water per acre. The spray should be directed into whorls. When the infestion is heavy, imamectin benzoate 5SG @80g (0.4g/l) or Spinosad 45SE @60ml (0.3g/l) in 200 lit of water should be sprayed per acre. Poison baiting is effective in controlling later instar larvae. 10 kg rice bran + 2kg jaggery in 2 lit of water are mixed and fermented for 24 hrs. Next day 100g thiodicard is mixed and dropped in the whorls of the plants. **Diseases:** The important diseases of maize are leaf blight (*Helminthosporium turcicum*) ,rust (*Puccinia sorghi*), late wilt
		(Cephalosporium maydis) and charcoal rot (Macrophomina phaseolina). Two sprayings of Mancozeb @ 3 g/l at 15 days interval starting from knee high stage of the crop controls the leaf blight and rust.

9	Irrigation schedule along with critical stages	**Four to six irrigations are needed for maize crop. 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 skipped and if only four irrigations are given, one irrigation after the dough stage may be skipped. The irrigation schedule may however be changed suitably based on the soil and weather conditions.**
10	Harvesting	**For short duration varieties: 90 days** **For medium duration varieties: 90-100 days For long duration varieties: 100-120 days**
11	Expected yield of the variety / Hybrid	**In general the hybrids yields will be 28 to 34 q/acre**

Rice-fallow Maize under zero tillage

- Sowing time is November to January in Coastal Andhra Pradesh.
- No preparatory tillage**.**is done
- Dibble 3-4 seeds after harvesting *Kharif* rice at 4-6 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 60 x 20 cm**.**
- Spray Gramoxone / Paraquat @ 1.0 lit/acre (5 ml /l) to prevent the regrowth of rice stubbles**.**
- Spray Atrazine 800 g - 1.2 kg/acre (4 g/l) immediately after sowing or next day to prevent
  broad leaved weeds**.**
- Ensure proper moisture at the time of spraying herbicide**.**
- Adopt fertilizer management and need based plant protection measures like normal *Rabi* maize.

- Provide 5-6 irrigations based on the soil type and climatic conditions**.**

<u>Management practices under heavy cyclonic rains :</u>

1. Drain out the excess water at the earliest.

Apply booster dose of 20 kg urea +10 kg MOP/acre after draining excess water.

MAIZE FALL ARMYWORM / LEAF WHORL ARMYWORM

Guide for Pest Management Practices

Spodoptera frugiperda

Host Plants : Sorghum, Pearl Millet, Sugarcane

Egg mass of Fall Armyworm

Larval head is dark with a pale inverted Y-shaped marking on the head and four dark spots on tail end of the abdomen

Torn appearance of plant due to feeding by grown up caterpillars

Preventive measures

- Deep ploughing to expose pupae for predation and direct exposure to sun light
- Wherever possible, sow early at first rain and follow synchronous planting in entire maize area to reduce population build up and multiple generations of FAW
- Intercrop/Alley/Mixed crop of maize with suitable pulse crops of particular region (pigeon pea/black gram/ green gram)
- Follow proper crop management process through recommended dose of manures and fertilizers

Monitoring

- Start scouting as soon as maize seedlings emerge and observe for the presence of damage symptoms
- Observe for the presence of egg mass or white patches on leaves. At later stages observe for damage on leaves (elongated holes, torn appearance with frass)
- Action threshold: **Early to mid whorl stage (15-30 days after sowing)** - 5 to 10 % damaged plants
- **Mid stage (30-50 days after sowing)** - 10-20 % damaged plants
- **Later stage (50-70 days after sowing)** – more than 20 % damaged plants

Control measures

- Collection and destruction of egg masses and neonate larvae whenever seen in the field
- Application of 5% NSKE / neem formulation - azadirachtin 10000 ppm @ 2 ml per liter of water to kill eggs and neonate larvae
- At early crop stage (15-30 days after sowing): Release egg parasitod *Trichogramma pretiosum* @ 3 cards (50000 eggs)/acre - two times at 15 days interval. (Egg cards are available at NBAIR, Hebbal and RCIPMC, Kadugodi, Bangalore and State biocontrol labs)
- Spray entomopathogenic fungi *Metarhizium rileyi* (= *Nomuraea rileyi*) @ 2-3 grams per liter of water (It is available at UAS, Dharwar) or *Metarhizium anisopliae* @ 3 grams per liter (it is available in all state biocontrol labs)

Note : Spray should be directed into to the leaf whorls

Control measures

- Application of *Bt* insecticide @ 2 ml/l
- Spraying of spinetoram 11.7 SC @ 0.5 ml or chlorantraniliprole 18.5 SC @ 0.4ml or thiamethaxam 12.6 % + lambda cyhalothrin 9.5 ZC @ 0.5 ml per liter of water

Note: Spray should be directed into to the leaf whorls

Restrictions

- Restricted entry interval after insecticide sprays (REI)
- Bt insecticide – One day
- Spinetoram – Four hours
- Chlorantraniliprole – 12 hours
- Thiamethaxam + lambda cyhalothrin – 24 hours

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