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PACKAGE OF PRACTICES FOR GROUND NUT

1. ***INTRODUCTION:***

Groundnut is an important oilseed crop grown in India. Globally India ranks first in area and second in production. India, accounts for 31 % of the total groundnut area in the world (24.6 m. ha) and 22 % of the total production (35.7 mt.). In Andhra Pradesh it is mainly cultivated in Rayalaseema districts viz., Anantapur, Cuddapah, Kurnool,Chittoor districts and some mandals of Nellore district.

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2.*VARIETAL RECOMMENDATION*:

3.*LAND PREPARATION*:

❖Prepare the land till fine tilth is attained.
❖It facilitates root growth, peg penetration and pod development.
❖Weeds and clods are to be avoided.

4.*SEED RATE*: Depends on variety and season

•With traditional sowing 2 ha of area can be covered in a day while, with tractor an area of5-6 ha can be covered.
•25 Kg of seed per hectare can be saved due to tractor drawn seed planters compared to traditional behind the plough or bullock drawn gorru sowing.
•Hence, sowing with tractor drawn seed drill will reduce the seed and sowing cost .

6.*SEED TREATMENT*:

❖Seed should be treated with Imidachloprid @ 2 ml / kg seed followed by Tebuconazole 2ds @ 1g or Mancozeb @ 3 gm / kg seed.
❖If the seed is dormant, soak it in 0.05 % Ethrel solution for 12 hours followed by shade drying.
❖ *Trichoderma viride* seed treatment @ 4 g/kg seed for rot prone areas
❖*Rhizobium* inoculation is necessary for groundnut in non-traditional areas and rice fallows.

7.*SOWING TIME*:

8.*FERTILIZER RECOMMENDATIONS*:

❖Application of farm yard manure/ compost @ 10 tonnes /ha once in 2 – 3 seasons
❖NPK recommendations should be on soil test basis
❖Apply 20N + 40 P_2O_5 + 50 K_2O kg/ha as basal for kharif crop. Phosphorus should be applied through single super phosphate.

❖For rabi apply 20N + 40 P_2O_5 + 50 K_2O kg/ha as basal and 10N kg/ha at flowering
❖Apply Gypsum @ 500 kg /ha at flowering stage by placement.
❖Wherever Zinc deficiency is observed, apply Zinc sulphate 50 kg/ha. once in 3 seasons.

❖Wherever Iron deficiency is noticed on crop, spray 0.5 % ferrous sulphate along with 0. 1 % citric acid two times with one week interval.
❖Seed treatment with Rhizobium and soil application of Phosphorous Solubulising Bacteria will reduce the chemical fertilizers requirement.

9.*WEED MANAGEMENT*:
❖Crop must be weed free up to 45 days after sowing.
❖Intercultivation at 20 and 40 DAS followed by one hand weeding.
❖The crop should not be disturbed by weeding or intercultivation after 45 DAS.
❖Preplanting application of Fluchloralin @ 2.5 to 3 l. / ha.
❖Pre-emergence application of Butachlor /Metalachlore/ Pendimethalin @ 2.5 to 3 l./ ha. or Oxyflourfen @ 1.5 to 2.0 l./ha followed by one intercultivation and one hand weeding will effectively control the weeds.
❖Wherever, pre-emergence herbicides could not apply, weeds can be controlled by post-emergence herbicides by spraying Imazethaphyr @ 750 ml/ha or Quizalofop ethyl @ 1.0 l/ha at 20 DAS when the weeds are at 2 leaved stage.

10.*IRRIGATION MANAGEMENT*:
❖Groundnut crop requires on an average 400 to 450 mm depth of water.
❖Good crop of groundnut requires 8 to 9 irrigations at 10 day interval starting from 25 DAS.
❖After the crop is established, it is necessary to with held irrigation for about 25 days to create stress which helps in synchronization of flowering.
❖The last irrigation is to be at 90 days after sowing.
❖About 24-30 % irrigation water can be saved due to use of sprinklers.

Soil moisture conservation practices should be followed in rainfed crop viz.,

❖Apply 12.5 tonnes of groundnut shells per hectare at 15-20 DAS as mulch to reduce evaporation losses of soil moisture.
❖To reduce transpiration losses from crop canopy, spray calcium sulphate solution (50 g/l).
❖Spray urea solution (20 g/l) during dry spell period in order to make recover the crop from stress.
***Critical stages for water requirement*:** Flowering**,** peg penetration and pod development,

11.*PEST MANAGEMENT*: A. Insect Pest management:

1.Red hairy caterpillar: Identification:
❖·Young larvae feed gregariously on the undersurface of leaves.
❖·Grown up larvae feed individually by devouring leaves, flowers and growing points.
❖·When the pest is severe only the bare stem points remain resulting in heavy yield loss.
❖·Early instar larvae are ash brown in color, but when fully grown assume reddish colorwith hairs on the body.
Problem areas: Srikakulam,Visakhapatnam, Kadapa, Kurnool, Anantapur and Chittoor districts.

Remedies:

❖·Pre-monsoon deep ploughing (two/three times) will expose the hibernating pupae to sunlight and predatory birds.

❖·Removal and destruction of alternate wild hosts which harbour the hairy caterpillars. ❖·Use trap crops around main crop Eg. Cowpea.

❖·Monitor the emergence of adult moths through light trap.

❖·Organize bonfires on community basis from 7.30 PM to 11.0 PM to attract the newly emerging moths for 3 or 4 succeeding days when good showers are received.

❖·Collect and destroy egg masses and early instars larvae.

❖·Dust Quinolphos or Carbaryl @ 25 kg /ha to control early instars of the caterpillar.

❖To control grown up larvae, spray Dimethoate @ 2.0 ml or Monocrotophos1.6 ml/l of water.

❖·Trap and kill the migrating larvae in deep cut straight trenches by dusting Methyl parathion 2% in the trench around the field.

2.Root grub:

Identification:

❖Young grubs feed on rootlets and nodules.

❖Old grubs devour the entire taproot.

❖Affected plants wither and die. Such plants when pulled from the soil, the devoured taproot can be clearly seen.

❖Damage usually occurs in patches.

❖Pest usually occurs in August and September months.

Distribution: In localized parts of A.P.

Remedies:

❖Pre-monsoon deep ploughing (two/three times) will expose the hibernating pupae to sunlight and predatory birds

❖Apply 10 G Phorate granules @ 1.5 kg a.i. /ha at the time of sowing.

❖Seed treatment with chlorpyriphos @ 6 ml /kg in root grub problem fields or Imidachloprid 2ml/kg seed.

3.Leaf miner: Identification:

❖Small blister like mines appear initially on the upper surface of the leaf.

❖At severe stages entire leaflet becomes brown and it rolls, shrivels and dries up.

❖Severely infected crop may die and give burnt appearance in the field when we see from distance.

Problem areas: Presently it is a major pest in all parts of the state.

Remedies:

❖Rotation of groundnut with non-leguminous crops should be followed to reduce the pest incidence.

❖Rotation of groundnut with soybean should be avoided.

❖Collection and destruction of moths by setting light traps early in the season.

❖Keeping pheromone traps in the field.

❖Spraying of Quinolphos 2.0 ml or Monocrotophos 1.6 ml/l of water should be followed.

4.Tobacco caterpillar (*Spodoptera litura*)

Identification

❖Larvae long, Stout, pale green (or) brown with black spots on the body
❖During daytime it hides in cracks and crevices.
❖Eggs are small and in masses, covered with yellow anal hairs
❖In initial stages larvae congregate and scrapes and skeletonises on the leaves.
❖Leaves become white papery.
❖In severe cases it defoliates.
❖Grown up larvae disburses and make irregular holes

Problem Areas

All groundnut areas (Anantapur, Cuddapah, Chittoor, Karimnagar).
Severe in the months of September, October and November.

Remedies

❖Monitor the pest from September last week onwards by Pheromone traps @ 10 per ha.
❖Collection and destruction of eggs masses and damaged leaves along with gregarious larvae.
❖For early stages spray neem oil 5ml or Chlorpyriphos 2.5 ml or Monocrotophos 1.6 ml per liter of water.
❖Arrange bird perches @ 25 per ha.
❖Spray N.P.V 500 LE/ha. from third instar larvae
❖Make deep plough furrow around the field and dust with methyl parathion or Endosulfan dust to control migratory caterpillars
❖For late instar (3rd onwards) larvae spray Thiodicarb 1.0 g or Novaluron 1.0 ml or Chlorfenpyr 2.0 ml/l. of water
❖Use poison bait to attract and to control late instar larvae per hectare

❖Mix the above and make small pellets and apply them in one hectare, during evening hours near base of plants.

5.Sucking pests (Jassids, Aphids and Thrips):

Identification:

❖Jassid infestation results in yellowing of the leaves.
❖Thrips infestation results in curling of leaves and stunting of the crop.
❖Aphid infestation results in chlorotic plants and curling of leaves.
❖Aphids and thrips transmit Rosette and Bud necrosis diseases of groundnut.**Distribution:** Present in all groundnut growing areas.

Remedies: Spraying of Monocrotophos 1.6 ml or dimethoate 2.0 ml or Imidacloprid 0.4 ml per liter of water

6.Storage Pests:

❖Groundnut bruchid which occurs in storage.
❖Spray 5% Malathion on pod and gunny bags.
❖Fumigation with aluminium phosphide tablets 3-5 tablets /tonne of groundnut pods.
❖Mixing neem oil 5 ml/kg of pods protect from bruchid.

B. DISEASE MANAGEMENT:

1.Tikka leaf spot Identification:

·In case of early leaf spot, the lesions are sub circular and 1-10 mm diameter and dark brown on the upper surface of the leaf

·In case of late leaf spot, the lesions on the leaf are small, more nearly circular and darker than those of early leaf spot.

·Both the lesions may also appear on the stem, petiole and pegs

Problem areas: Both the leaf spots are commonly present in all groundnut-growing areas, but, the incidence as relatively more in North coastal and heavy rainfall areas.

Remedies:

·Removal of infected plant debris

·Crop rotation should be followed

·Seed treatment with Tebuconazole 2ds @ 1g or mancozeb @ 3 g/kg of seed

·Growing tolerant varieties *viz*., Vemana, Kadiri Harithandra, JCG-88, Abhaya and Kadiri 7 bold, Kadiri-9

·Spraying of mancozeb @ 1000 g + Carbendazim @ 500 g /ha or Hexaconazole @ 1000 ml or Chlorothalonil @ 1000 g or Tebuconazole @ 500 ml/ha in 500 liter of water at fortnightly intervals from first disease appearance.

2.Rust:

Identification:

·Orange coloured pustules appear on the lower surface of the leaflets

·In severe cases, lesions also appear on other plant parts expect flowers**Problem areas**: Occurs in all groundnut-growing areas

Remedies:

·Removal of infected free areas

·Collect seed from disease free areas

·Seed treatment with Tebuconazole 2ds @ 1g or 3 g of mancozeb/kg of seed

·Spraying of mancozeb @1000 g or Chlorothalonil @1000 g or Tridemorph @1000 g /ha in 500 liter of water at 15 days interval starting from disease appearance.

3.Collar rot:

Identification:

·Rapid desiccation of the affected plant

·Affected tissue is covered with black mass of spores

·In mature plants, lesions develop on the stem just below the soil surface and then spread upward along the branches.

·In mature plants, symptoms generally do not appear until the wilting of the entire plant is apparent

Problem areas: More prevalent in light sandy soils

Remedies:

·Select healthy seed

·Seed treatment with Tebuconazole 2ds @ 1g or mancozeb 3 g/kg or Captan 2 g/kg of seed

·Deep sowing of seed should be avoided

·Deep ploughing of fields and destruction of plant debris

·Crop rotation with chickpea reduces the disease

4. Dry root rot:

4.**Stem rot: Identification:**

·Appears generally after 70 days of sowing

·Yellowing and wilting of branches just above the soil

·White mycelium of the fungus develops around the affected stem above the soil level

·Infection of pegs and pods occurs in severe cases and seeds turn to bluish colour\

Problem areas: Occurs in areas where the soils are heavy

Remedies:

·Deep ploughing in summer

·Selection of healthy seed

·Seed treatment with Tebuconazole 2ds @ 1g or mancozeb @ 3 g/kg of seed

·Soil application before sowing with *Trichoderma viride* developed by mixing 225 kg farm yard manure +25 kg neem cake + 5 kg *Trichoderma viride/*ha and allow to grow for 15 days under shade

·Gypsum application @ 500 kg/ ha

·Timely management of foliar diseases leads to reduction of incidence of stem rot

4.Peanut Stem Necrosis Disease (PSND)

Identification:

·Necrotic lesions on terminal leaf lets, death of top growing bud on main stem followed by necrosis of all top buds on primaries. Complete stem necrosis and often-total necrosis of entire plant in early infection

·Infected plants become stunted and showed auxiliary shoot proliferation with small sized and chlorotic leaflets

·Necrotic spots on pods. Testa are not discolored or mottled

Problem Areas: Anantapur, Mahaboobnagar, Kurnool and Chittoor districts of A.P.

Remedies:

·Seed treatment with Imidachloprid @ 2 ml/Kg of seed

·Weds such as *Parthenium hysterophorus, Tridax procumbence, Ageratum conyzoides, Cleome viscose, Commelina benghalensis, Vernonia cineraria, Achyranthus aspera, Acanthospermum hispidum. Acalypha sp.* should be removed before flowering in and around the field

·Barrier crops namely bajra, maize and sorghum should be planted in 4-8 rows around the groundnut field. These will prevent thrips and wind borne weed pollen carrying virus

·Grow inter crop with bajra/ sorghum/ maize in the ratio of 7:1 or 11:1

·Spraying of monocrotophos @ 800 ml or Dimethoate @ 1000 ml or Imidachloprid @ 200 ml/ha in 500 liters of water at 25-30 days after sowing

5.Peanut bud necrosis disease:

Identification:

·Initial symptoms appear on young leaflets as chlorotic spots and develop in to chlorotic or necrotic ring spots

·Terminal bud necrosis on main stem followed by death of top buds on all primaries

·Stunting growth with reduced size of leaflets and petioles

·Leaflets produced on auxiliary shoot showed reduction in size, distortion of lamina and mosaic

Remedies:
·Use of tolerant varieties *viz.*, R-8808, ICGS-11, 44
·Intercropping with bajra (7:1)
·Spraying of monocrotophos @ 800 ml or Dimethoate @ 1000 ml or Imidachloprid @ 200 ml/ha in 500 liters of water at 25-30 days after sowing
·Maintenance of recommended plant population

12.*HARVESTING:*

❖Should be done at right stage of maturity
❖At the time of 70-80% leaves and stems turn yellow
❖When the inner side of the shell turn black
❖When sufficient moisture is available in the root zone

13. *STORAGE*:

❖Seed should not contain more than 9% moisture for storage
❖Prefer poly ethylene/gunny bags for storage
❖Spray Malathion 5 ml / liter of water once in 2-3 weeks on storage bags against storage pests.

14.*TIPS FOR INCREASING PRODUCTION*

❖Deep summer ploughing
❖Adoption of quality seed of HYV
❖Use small seed with out shrivelling of improved varieties
❖Seed treatment
❖Adoption of recommended seed rate
❖Adoption of Ferti-cum- seed drill to ensure right placement of seed and fertilizer
❖Ensure optimum population
❖Adopt recommended fertilizer dose
❖Apply Gypsum and SSP to provide calcium and Sulphur
❖Avoid inter cultivation/weeding after 45 DAS.
❖Adopt IPM Package
❖Practice crop rotation and intercropping
❖Use mechanization for sowing, inter cultivation ,harvesting and stripping to reduce cost of cultivation