Notes

Practical 1

VISIT TO A PADDY FIELD

Objective

After completing this practical you will be familiar with paddy field and crop.

Tools/ Equipments/ Material required

Paddy field, notebook, pen

Procedure

1. Visit a paddy farm/ field with the prior approval of the farm manager or in-charge.
2. Contact the farm manager or farm in-charge and collect the information about the farm, different activities performed in the farm throughout the day and the working schedule.

Observations & Result

Observe the paddy farm and note down the following:

- Name and address of the farm visited:

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- No. of paddy fields:

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- Routine farm activities:

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Notes

- Records maintained in the farm:

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- Talk with farmers and complete the table as given below:

Field No.	Previous crop grown in that field	Area under paddy	Yield expected (q/ha)

Precautions

- Enter the farm with the prior approval of the farm manager or in-charge.
- Do not cause hindrance or not interfere in the specific farm activities.
- Do not pull plants at the field.
- Avoid spitting, sneezing and unhygienic practices inside the farm premises.

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Practical 2

IDENTIFICATION OF DIFFERENT GROWTH STAGES OF PADDY PLANT

Objective

After completing this practical you will be able to identify different growth stages of a paddy plant.

Tools/ Equipments/ Material required

Paddy crop, tags, notebook, pen.

Procedure

1. Visit a paddy field.
2. Select a sample plot of 2 x 2 m^2 for observation.
3. Select 10 plants of the sample plot and tag them for taking observation.
4. Revisit the plot at regular intervals.

Observations & Result

Note down the following observations from tagged plants:

Date of visit	Growth stage	Plant height (cm)	Other plant features

Notes

Precautions

- Do not select sample plot from corner as may be disturbed by animals/ human beings and also genetic purity of the variety may be altered by nearby crops.
- Tag plants carefully, without harming them.
- Take observations carefully, without interfering the farm activities.

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Practical 3

IDENTIFICATION OF DIFFERENT PADDY VARIETIES

Objective

After completing this practical you will be able to identify different paddy varieties.

Tools/ Equipments/ Material required

Various paddy varieties, scale, notebook, pen.

Procedure

1. Collect fully developed plant of few popular local paddy varieties from your locality.
2. Collect fully developed plant of few High Yielding recommended paddy varieties.
3. Compare the local and high yielding varieties.

Observations

Name of the variety	Plant height (cm)	No. of tillers	Duration	Yield potential (q/ha)	Remarkable features

Notes

Result

The ..... varieties are more promising for our locality than .....

Few important characteristics of these promising varieties are:

1. .....
2. .....
3. .....
4. .....
5. .....

Precautions

- Always avoid collection of the sample variety from corner.
- Contact Agriculture Department/ nearby Krishi Vigyan Kendra or Agriculture Institute regarding recommended varieties for the area.
- Do not keep the sample for more than 1 week for taking observation as after that plant's height may be altered.

Suggested activity

Make a chart of high yielding suitable varieties of your state with their characteristics.

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Practical 4

SEED TREATMENT IN PADDY

Objective

After completing this practical you will be able to perform seed treatment in paddy.

Tools/ Equipments/ Material required

Bucket, paddy seeds, fungicides (carbendazim, streptocycline), water, gunny bags.

Procedure

1. Take a bucket with capacity of 10-15 litres and fill it with 10 litres water.
2. Add 20 g of carbendazim and 5 g of streptocycline.

Fig. 4.1: Mixing of fungicides and seed of paddy

3. Add 10 kg of paddy seed and mix in water solution. Leave it for 24 hrs.
4. Remove the seeds from the water and put it in gunny bags for 10-12 hrs to allow them for sprouting.

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Fig. 4.2: Packing of soaked seed in gunny bags

Observations

Observe the seeds for sprouting. Note down your remarks:

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Result

Pre germinated/ sprouted seeds are ready for sowing.

Precautions

- Arrange high yielding varieties recommended for your area.
- Use good quality fungicide.
- Check the labels on fungicide for its quality and how to use.
- Do not get in contact with fungicide directly, use hand gloves.

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(Signature of Instructor)

Practical 5

SEEDLING TREATMENT IN PADDY

Objective

After completing this practical you will be able to perform seedling treatment in paddy.

Tools/ Equipments/ Material required

Bucket, paddy seedlings, fungicides (carbendazim, streptocycline), water, gunny bags.

Procedure

1. Take a water tub of 10 litre capacity and fill it with water.
2. Mix 20 g of carbendazim and 5 g of streptocycline and mix properly.

Fig. 5.1: Preparation of solution for seedling treatment

3. Make the appropriate size of seedling bunch and put it into the tub by keeping the roots inside solution.
4. Leave seedling bunch in solution for 5-20 minutes
5. Seedling is ready for transplanting.

Fig. 5.2: Dipping of roots of seedling in solution

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Observations

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Result

Fungicide treated seedlings are ready for transplanting.

Precautions

- Uproot the seedlings carefully.
- Use good quality fungicide.
- Check the labels on fungicide for its quality and how to use.
- Do not get in contact with fungicide directly, use hand gloves.
- Transplant the seedlings immediately after treatment.

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(Signature of Instructor)

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Practical 6

NURSERY BED PREPARATION BY WET BED METHOD

Objective

After completing this practical you will be able to prepare nursery bed by wet bed method.

Tools/ Equipments/ Material required

A field plot, sprouted paddy seeds, fungicides, fertilizers, irrigation facility.

Procedure

1. Select a levelled, fertile plot for seed bed.
2. Plough the seed bed area twice and then puddle by giving two or three more ploughings.
3. After 10 days, the field is again ploughed twice and levelled to bring it to fine soft puddled condition.
4. Construct raised beds (4 - 5 cm high) of 1.2 m wide and of convenient length with 45 cm channel all around. Raised beds are not necessary in areas where water-logging is not a problem.
5. Drain off the excess water to maintain a water level just sufficient to cover the soil. The surface of the seed bed is so levelled that there is a gradual inclination towards both sides to facilitate drainage of water during the first few days.
6. For each 100 m^2 area of nursery bed, provide 1 kg Nitrogen (N_2), 0.4 kg Phosphorus (P_2O_5) and 0.5 kg Potash (K_2O). Double the P_2O_5 application in locations where cool temperatures retard the growth of seedlings. The fertilizers are mixed with soil before sowing.
7. Sow (broadcast) pre-germinated fungicide treated seeds on a drained bed at the rate of 50-70 g (unsoaked weight basis) per square meter depending upon the size of the seed. If seeds are sown too closely seedlings will be weak. It will be also more difficult to pull seedlings and there will be more chances of injury to the long roots of adjacent seedlings.
8. Keep the beds moist for the first few days. Do not flood the beds. When the seedlings are about 2 cm high, keep the beds submerged in a shallow layer of water.

Notes

9. Top dress the seed beds with 0.3 kg to 0.6 kg N_2 /100 m^2 area, 6 days before transplanting.

10. Appropriate control measures should be taken for pests and diseases in the nursery, if they occur.

Observations

Seedling is ready for transplanting in 20-25 days after sowing (4 leaf stage).

Note down your observations:

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Result

Fungicides treated quality seedlings are ready for transplanting.

Precautions

- There should be sufficient water available.
- Shelter the seed bed if heavy rain occurs shortly after sowing.
- Pull the seedlings carefully.
- Transplant seedlings at right stage.
- Irrigate seed bed at frequent intervals to avoid drought condition.

Procedure for pulling the seedlings out of seed bed:

Seedlings are ready for transplanting from 20 to 25 days after sowing. Seedlings more than 30 days old when transplanted recover more slowly than younger seedlings, especially if they suffer stem and root injury. Seedlings less than 20 days old are too short to be pulled from the soil. The procedure is as follows:

- Two to three seedlings are grasped at a time.
- The seedlings are held between the thumb and forefingers, and as close to the base as possible.
- They are pulled gently and easily at an angle of about 30° on the horizon.
- If too much mud sticks to roots, it is washed by shaking the roots in water. The plant roots should not be thrashed against feet or any object to remove mud as this will injure the plants.
- Convenient size of seedling bundle (5 - 8 cm in diameter) is made by tying with any soft material and the seedling should be protected from drying.

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(Signature of Instructor)

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Practical 7

NURSERY BED PREPARATION BY DRY BED METHOD

Objective

After completing this practical you will be able to prepare nursery bed by dry bed method.

Tools/ Equipments/ Material required

A filled plot, sprouted paddy seeds, irrigation facility.

Procedure

1. Plough the field three to four times till the soil is thoroughly pulverized.
2. Prepare beds of the same size as in wet nurseries but 15 centimeters high with channels (30 cm wide) between them.
3. Sow the seed in rows 10 cm apart in dry or moist condition of soil. Use the same seed rate and fertilizer as in wet nurseries.
4. The sown seeds should be taken for water management in these beds.
5. Allow the water to run in channels first and then raise the level of water slowly to saturate the soil of beds.
6. Do not flood water in beds. Keep the seed bed saturated with water all through.
7. Maintain a thin film of water if possible after 5 days of sowing.
8. Follow all the operations as described for wet nurseries.

Observations

- Seedlings ..... (grow/ not grow) as fast as wet bed seedlings.
- Seedlings on dry bed will be ready for transplanting in ..... days.

Result

Seedlings are ready for transplanting.

Notes

Precautions

- Pull seedlings carefully.
- The nursery bed area should be properly levelled or on a gentle slope.
- Cover the bed with fronds or leaves if heavy rains or bird meance is there.
- Do not construct dry bed nurseries unless sufficient water is available.

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(Signature of Instructor)

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Practical 8

NURSERY BED PREPARATION BY DAPOG METHOD

Objective

After completing this practical you will be able to prepare nursery bed by dapog method.

Tools/ Equipments/ Material required

A polythene sheet, sprouted paddy seeds, compost, water.

Procedure

1. Place a polythene sheet on the levelled nursery bed.
2. Spread a compost layer to a height of 1.5 - 2 cm on it.
3. Sow the sprouted seeds to a density of 1 kg/m^2.
4. Sprinkle water over the seeds gently, taking care not to dislodge them.
5. Keep the bed continuously flooded with a thin layer of water from 3rd day onwards.
6. Seedlings will be ready for transplanting after 12-14 days, regardless of the duration of the variety.
7. On the day of transplanting, simply roll up the entire seedling mass (the roots will have matted together to form a soft of rug), throw it over your shoulder, and head for the field.

Observations

- The seedlings are ready for transplanting in ..... days.
- There are ..... leaves per seedling at the time of transplanting.
- Average height of seedlings is ..... cm.
- Seedlings are ..... (tender/ very tender/ hard).
- Handling of seedling is ..... (tough/easy).

Notes

Result

Seedlings developed by dapog method are ready for transplanting.

Precautions

- Do not over flood the seedlings by water.
- Use good quality compost only.
- Use sprouted seedlings for quick germination.

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(Signature of Instructor)

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Practical 9

NURSERY FOR SYSTEM OF RICE INTENSIFICATION (SRI)

Objective

After completing this practical you will be able to prepare nursery for System of Rice Intensification (SRI).

Tools/ Equipments/ Material required

A filled plot, pre-germinated paddy seeds, compost/ manure, soil, rice husk, water.

Procedure

1. Soak paddy seeds should in water for 24 hours.
2. Prepare a mixture of compost (20% FYM/Vermicompost/poultry manure) + soil (70%) + rice husk/ sand (10%).
3. Prior to seeding, lay down the prepared mixture on the plastic sheet or used polythene/ gunny bags spread on the shallow raised bed (to prevent root going deep into soil).
4. Broadcast the pre-germinated seeds onto the bed at a rate of about 200g for every 3 m^2, and then cover the seeds with a fine layer of soil.
5. Water the seedbed every day in the late afternoon, or as often as needed to maintain a moderate level of soil moisture.
6. Transplanting should be done when the seedlings are at two leaved stage. This usually occurs between 8 and 12 days.

Observations

- The seedlings are ready for transplanting in ..... days.
- There are ..... leaves per seedling at the time of transplanting.
- Average height of seedlings is ..... cm.
- Seedlings are ..... (tender/ very tender/ hard).
- Handling of seedling is ..... (tough/easy).

Notes

Result

Seedlings developed at nursery for System of Rice Intensification (SRI) are ready for transplanting.

Precautions

- Discard irregular or light seeds.
- The seedbed should be prepared as closely as possible to the field, so as to minimize transport time between seedling removal from the seedbed and their transplanting in the field.
- The nursery soil should not be saturated or kept continuously wet. If there has been rain during the day, no need of watering.
- Do not sow all the seeds at the same time. Rather, appropriate batches of seed should be sown on successive days, so that the plants when they are put into the field can be a uniform age, all between 8 and 12 days.

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(Signature of Instructor)

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Practical 10

PUDDLING AND FIELD PREPARATION FOR TRANSPLANTING

Objective

After completing this practical you will be able to perform puddling and prepare a field for transplanting of paddy seedling.

Tools/ Equipments/ Material required

broad spectrum, power tiller with attached mouldboard plough, puddler, fertilizer.

Procedure

1. At dry field condition, apply broad spectrum weedicide to kill weeds and for better field hygiene.
2. Plough the field with power tiller with attached mouldboard plough to break big clods of soil.
3. Irrigate the field and maintain standing water at 50-100 mm level for about 3-7 days or until it is soft enough and suitable for an equipment to use.
4. Churn the soil in standing water by puddler to break soil aggregate and hasten decomposition.
5. Apply fertilizers to place nutrients in the reduced zone.
6. Repeat puddler in standing water in cross direction.

Observations

- The soil tilth is ..... (smooth/ coarse/ hard) after puddle.
- It took ..... hrs to puddle ..... ha land.

Result

The field is ready for transplanting.

Notes

Precautions

- Maintain water in field while puddling.
- Destroy weeds before maintaining stagnate water.
- Maintain safety precautions while handling the equipments.

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(Signature of Instructor)

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Practical 11

METHODS OF DIRECT SEEDING FOR DRY SOIL

Objective

After completing this practical you will be able to apply different methods of direct seeding for dry soil.

Tools/ Equipments/ Material required

Harrow, seed drill, dibbler.

Direct seeding on to dry soil can be done by any of the following methods:

(i) Broadcasting.

(ii) Drilling with seed drill.

(iii) Dibbling.

Procedure

- **Broadcasting:**
  1. Prepare a pulverised levelled field using mouldboard plough, harrow and leveller.
  2. Make furrows on well prepared field through harrow.
  3. Broadcast seeds freely or in furrow.
  4. Cover the seeds by spike-tooth harrow.
- **Drilling with seed drills:**
  1. Prepare a pulverised levelled field using mouldboard plough, harrow and leveller.
  2. Make furrows on well prepared field through harrow.
  3. Place seeds by seed drill machine on prepared furrows.
  4. Apply fertilizers alongwith seed drills.
  5. Precision equipment, such as the Turbo Happy Seeder, can also be used to drill seeds.

Notes

- **Dibbling (hill planting):**

  The method of seed dibbling is used on unlevelled or sloppy lands or where ploughing and harrowing is difficult.

  1. Wet the field as it is much easier to use a dibber in wet soil than it is in dry soil.
  2. Firmly, but slowly, push the dibber into the ground to make your initial hole at proper depth. One method that will allow you to ensure that you reach the proper depth is to measure on the dibber where you want the top of your hole to be. With that mark in place, simply press the dibber into the soil until the mark is at ground level.
  3. Place the seed into the hole. While doing this, apply as gentle pressure as possible to ensure that you do not accidentally damage the roots.
  4. Cover the seeds with soil.

Observations and Result

Uniform plant growth is observed. Gap filling may be done if some seeds don't germinate. Record your observations:

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Precautions

- Use pre germinated seeds.
- For uniform crop stand, smooth and levelled seedbed is necessary.
- Seed should not placed more than 10 to 15 mm deep.

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(Signature of Instructor)

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Practical 12

METHODS OF DIRECT SEEDING FOR WET SOIL

Objective

After completing this practical you will be able to practice different methods of direct seeding for wet soil.

Tools/ Equipments/ Material required

Drum seeder, pre-germinated seeds

In irrigated areas, direct wet seeding is done by placing the seed on well prepared wet field through broadcasting or sowing with drum seeder.

Procedure

- **Broadcasting of sprouted seed on puddle soil:**

  1. Puddle the land and level thoroughly.
  2. Drain excess water or keep shallow standing water.
  3. Broadcast the pre germinated seed.
  4. Field should be irrigated 10 to 15 days after seeding or full emergence.

- **Seed sowing by drum seeder in puddled soil:**

  1. Puddle the land and level thoroughly.
  2. Drain out excess water before sowing, but do not let the soil surface become dry.
  3. Sow the pre germinated seeds with drum seeder.
  4. Increase the depth of water gradually as the seedlings grow but do not completely submerge seedlings.
  5. Do not irrigate for 2-3 days after sowing to allow roots to anchor.
  6. Floodwater can rise as the seedlings grow to give better control of weeds.

Notes

Observations and Result

Uniform plant growth is observed. Gap filling may be done if some seeds don't germinate. Record your observations:

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Precautions

- Use pre germinated seeds.
- For uniform crop stand, smooth, levelled and puddled field is necessary.
- Seed should not placed more than 10 to 15 mm deep.
- If there is muddy condition in the field, allow it to dry for 24 hours to settle soil particles before broadcasting. It will help in proper emergence of plant.
- Do not fill drums more than 2/3 full.
- Walk at steady speed while using drumseeder.
- A well trained operator is also required for seed drilling by drum seeder. Otherwise, uneven seeding may occur which may lead to an uneven plant stand.
- Take care during the wet season as rainfall immediately after seeding may wash away the newly sown seeds.

Pre germinated seeds

Pre- germinated seeds are used for direct seeding on wet soil. Seed should be soaked in water for 12 hours. After 12 hours, drain water and add seed treatment chemicals in wet seed. To get pre-germinated seed, the seed should be kept in moist jute bags after treatment for 24 hours. Air-dry the sprouted seeds in the shade for about 10-15 minutes before sowing to facilitate separation of seeds.

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(Signature of Instructor)

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Practical 13

IDENTIFICATION OF NUTRIENT DEFICIENCY SYMPTOMS OF PADDY

Objective

After completing this practical you will be able to identify and manage nutrient deficiency symptoms of paddy.

Tools/ Equipments/ Material required

Affected leaf samples, notebook, pen.

Procedure

1. Collect the leaf samples from paddy field having some abnormality in colour, shape.
2. Record the position of the leaf i.e. from which plant part it is collected.
3. Match these leaves symptoms from with the nutrient deficiency symptoms given in section 6.5 of study manual.
4. Identify the nutrient deficiency symptom and note down their control measures.

Observations and Result

S.No.	Leaf sample taken from	Observed deficiency symptoms	Suggested control measures

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Precautions

- Take fresh leaf sample.

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(Signature of Instructor)

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Practical 14

COMPUTATION OF FERTILIZER DOSE FOR PADDY CROP

Objective

After completing this practical you will be able to determine nutrient content in different fertilizer and computation of fertilizer dose for paddy crop.

Tools/ Equipments/ Material required

Notebook, pen.

Nutrient content in commonly used fertilizer is as follows:

1. Nitrogenous fertilizers

Urea	46% N
Ammonium sulphate	20% N
Ammonium chloride	25% N
Calcium Ammonium Nitrate (CAN)	25% N
Ammonium sulphate nitrate	26% N

2. Phosphatic fertilizers

Single Super Phosphate (SSP)	16% P_2O_5
Double super phosphate	32% P_2O_5
Diammonium Phosphate (DAP)	18% N, 46% P_2O_5
Triple super phosphate	46% P_2O_5
Rock phosphate	30% P_2O_5

3. Potassic fertilizers

Muriate of Potash (MoP)	58% K_2O
Sulphate of potash	48% K_2O

Notes

Problem: The recommended fertilizer dose for lowland paddy is 120: 60: 40: kg of N_2: P_2O_5: K_2O per hectare, respectively. Calculate the amount of fertilizer required in the form of Urea (46%N_2), Single Super Phosphate (16% P) and Muriate of Potash (60% K).

Solution: The formula for computing the fertilizer requirement is as follows:

Amount of fertilizer to be applied =

$$\frac{100}{\text{Nutrient content in material}} \times \text{Recommended fertilizer dose}$$

1. Requirement of Urea to supply 120 kg N/ha = $\frac{100}{46} \times 120 = 260.9$ kg or 261 k

2. Requirement of SSP to supply 60 kg P_2O_5/ha = $\frac{100}{16} \times 60 = 375$ kg

3. Requirement of MoP to supply 40 kg K_2O/ha = $\frac{100}{58} \times 40 = 68.9 = 69$ kg

Observations and Result

To supply recommended fertilizer dose of 120: 60: 40: kg of N_2: P_2O_5: K_2O per hectare

Urea required = 261 kg

SSP required = 375 kg

MoP required = 69 kg

Precautions

1. Use authentic high quality fertilizers.
2. Calculate fertilizer dose precisely.
3. Use more organic and bio fertilizers instead of chemical fertilizers.

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(Signature of Instructor)

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Practical 15

IRRIGATION SCHEDULING ON CRITICAL STAGES IN PADDY

Objective

After completing this practical you will be able to schedule irrigation at critical stages of paddy.

Tools/ Equipments/ Material required

Paddy crop, notebook, pen.

Procedure

1. Visit paddy field intermittently.
2. Determine the date of irrigation at different physiological growth stages of paddy crop.
3. Observe the crop and fill up following table according to crop requirement.

Observations

Field No	Date of Sowing	Ist Irrigation		IInd Irrigation		IIIrd Irrigation		IVth Irrigation		Vth Irrigation	
		Critical Stage	Date	Critical Stage	Date	Critical Stage	Date	Critical Stage	Date	Critical Stage	Date

Notes

Result

..... is the most critical stage for irrigation in paddy.

Precautions

- Irrigate the field at all critical stages.
- Drain excess water from the field.

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(Signature of Instructor)

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Practical 16

HERBARIUM PREPARATION AND IDENTIFICATION OF PADDY WEEDS

Objective

After completing this practical you will be able to prepare herbarium and identify paddy weeds.

Herbarium is a collection of plants that are dried, pressed and preserved on herbarium sheets and arranged in sequence in accordance of specific purpose for future reference, record and study.

Tools/ Equipments/ Material required

1. Sharp knife / scalpel – for cutting
2. Vasculum- It is a container made up of wood having a lid to keep the specimen in turgid condition
3. Plant press
4. A weed note book

Procedure

Herbarium collection

1. Collect the plant material at flowering stage.
2. It is desirable to maintain all the plant parts intact (leaf, stem, flowers, fruits).
3. Collect fresh part of the plant preferably apical part but not diseased.

Herbarium pressing and drying

- The wooden press board consist of 2 wooden plates of 12”x13” each which are tighten with nuts on bolts for pressing.
- Placing each of the collected specimens in between the folds of the newspaper for blotting.

Notes

- The specimen in newspaper folds are to be arranged on the lower part of the pressing board.
- Place upper plate on the top and tighten upper and lower parts with nuts and bolts.
- Keep the specimen for 24 hrs for sweating of moisture. This is called as Sweating period.
- If the leaf is large, cut it vertically into 2 halves and use one of the portions as specimen.
- The newspaper/bolting paper changes after 12 hrs in first incidence and pressing is done after 24 hrs, 48 hrs and 72 hrs till the specimen dries completely. This is called Natural drying.
- In artificial drying, after sweating period specimens are direct in hot air oven by maintaining 62°C.

Herbarium mountings

- Thick herbarium sheets of 11½" × 16½" are used for mounting.
- Keep the specimen in centre and spread properly.
- Fix the specimen to the mounting sheet with glue/gum/tape.

Observations

Sr. No.	Name of weed	Scientific name & family	Identification features	Control measures
1.				
2.				
3.				
4.				
5.				
6.				
7.				

Result

..... number of weeds were obtained from paddy field under observation.

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Practical 17

IDENTIFICATION OF IMPORTANT INSECTS OF PADDY

Objective

After completing this practical you will be able to identify important insects of paddy.

Tools/ Equipments/ Material required

Insect collection box, insect collection net, insect killing bottles, pins, pests affected plants.

Procedure

1. Visit paddy field at different growth stages.
2. Notify the incidence of pests on plant, if any.
3. Collect the insect pests and bring them to the laboratory.

Observations

S. No.	Name of pest	Growth stage	Observed symptoms	Suggested control measure

Notes

Result

Identification of the pests and their infestation will help in suggesting effective control measures.

Precautions

- Take care while collecting live insects.
- Use insect collection nets and bottles.
- Dry the collected samples immediately.

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(Signature of Instructor)

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Practical 18

IDENTIFICATION OF PADDY DISEASES

Objective

After completing this practical you will be able to identify the paddy diseases and prepare herbarium of paddy disease sample.

Tools/ Equipments/ Material required

Different diseased samples, polythene bags, gloves, sharp knife / scalpel, plant press, herbarium file, gum /cello tape.

Procedure

1. Observe paddy plant intermittently.
2. Notify the occurrence of diseases on plants, if any.
3. Collect the infected plant material and bring them to the laboratory.
4. Dry plant parts by plant press.
5. Paste the collected samples in herbarium file.
6. Note down the observations.

Observations

Sr. No.	Name of disease	Growth stage	Observed symptoms	Suggested control measure

Notes

Result

Identification of the disease and their infection will help in suggesting effective control measures.

Precautions

- Use hand gloves for collecting diseased plant parts.
- Take care while collecting disease samples.
- Take the collected samples immediately to the laboratory.

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Practical 19

MANUAL HARVESTING AND DRYING OF PADDY

Objective

After completing this practical you will be able to harvest and dry the paddy manually.

Tools/ Equipments/ Material required

Standing crop of paddy, oven, desiccator.

Procedure

1. Observe the right stage of harvesting paddy as described in the chapter e.g. spikelet or straw color.
2. Harvest one square meter of cropped area manually.
3. Take the grain sample from the produce and weigh it to the nearest 1 mg.
4. Estimate the moisture content in grain by following steps given below:
   - Place the sample in open dish together with the lid, in the oven and leave for 2 h from the moment when the oven temperature is between 130 and 133°C.
   - Rapidly take the dish out of the oven, cover it and place it in the desiccators.
   - When the dish has cooled to laboratory temperature (generally between 30 and 45 min after it has been placed in the desiccators), weigh it.

   Method of calculation

   The moisture content, expressed as a percentage by mass of the product as received, is given by the following formulae:

$$(m_0 - m_1)\frac{100}{m^0}$$

   Where, m_0 is the mass, in grams, of the sample ;

   m_1 is the mass, in grams, of the sample after drying

Notes

5. Dry the harvesting material in open field to safe moisture content for 24 hours after harvesting.
6. Thresh the material and collect the grains.
7. Estimate the moisture content in grains for storage purpose by the methods as given above.
8. Dry the material up to the desired moisture content (14%).

Observations

m_0 =

m_1 =

Moisture content of the harvested sample=

Result

Crop harvested at recommended moisture content have long storage life.

Precautions

- Use hand gloves for collecting diseased plant parts.
- Take care while collecting disease samples.
- Take the collected samples immediately to the laboratory.

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(Signature of Instructor)