Package of Practices
Integrated Disease and Pest Management (IDPM) in Brinjal (Eggplant)

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Crop: Brinjal (Eggplant / Aubergine)
Theme: Integrated Disease and Pest Management (IDPM)
Objective: To promote sustainable cultivation of brinjal by integrating cultural, biological, mechanical/physical, and need-based chemical methods for effective and eco-friendly management of key pests like the Shoot and Fruit Borer and major diseases.

A. Cultural Methods

These practices modify the crop environment to create conditions unfavorable for pests and diseases.

- **Deep Ploughing:** Plough the field deeply (15-20 days before final field preparation) to expose soil-borne pathogens and pupae of pests to sunlight and predators.
- **Field Sanitation:**
    - Regularly clip and remove infaded shoots at **6-7 day intervals** to physically remove borers.
    - Remove alternate hosts and clean field bunds to eliminate pest reservoirs.
- **Crop Rotation:** Avoid planting brinjal after other solanaceous crops such as potato, tomato, capsicum, and chilli for at least **three years** to break the pest and disease cycles.
- **Optimum Spacing:** Maintain proper spacing of **60 cm x 60 cm** (for moderate-sized and long-fruited varieties) to ensure proper aeration and reduce the incidence of fungal diseases.
- **Barrier and Trap Cropping:**
    - Use barrier crops like **maize or sorghum** around the field to trap and reduce pest populations.
    - Plant **marigold** as a trap crop to attract fruit borers away from the main brinjal crop.
- **Soil Solarization in Nursery:** Cover nursery beds with a **45-gauge (0.45 mm) polythene sheet** for three weeks before sowing to solarize the soil and reduce soil-borne pests and pathogens.
- **Nutrition and Mulching:**
    - Apply the recommended dose of fertilizers: **100:60:60 NPK kg/ha**, along with **5 t/ha of Farm Yard Manure (FYM)** .
    - Use **rice straw** as mulch material to conserve moisture and suppress weeds.
    - Apply **ash** on the foliage and around the base during the early hours of the day to deter pests.
- **Resistant/Tolerant Varieties:** Cultivate resistant or tolerant varieties such as **Shingnath, Kashi Utsav, Bidhan Suphala**, etc.

B. Biological / Botanical Methods

These methods utilize natural enemies, antagonists, and plant-based products for pest management.

- **Soil Application of Neem Cake:** Apply **neem cake @ 250 kg/ha** in two splits:
    - **First half:** At the time of planting/transplanting.
    - **Second half: 30 days after transplanting (DAT)** .
- **Seed Treatment:** Treat seeds before sowing with a mixture of **UmComb (@ 10 ml per kg seed)** and **CAU Bioenhancer (@ 10 ml per kg seed)** .
- **Seedling Root Dip Treatment:** Before transplanting, dip the roots of seedlings for **20-30 minutes** in a solution prepared by mixing **10 ml each of UmComb and CAU Bioenhancer** and **100 g of well-rotten FYM per litre of water**.
- **Enriched FYM Application:** Prepare enriched FYM by mixing **UmComb (@ 3 litres per 100 kg FYM)**, **UmMet (@ 3 litres per 100 kg FYM)**, and **CAU Bioenhancer (@ 3 litres per 100 kg FYM)** with cow dung. Apply this mixture in the field one week before sowing seeds or transplanting seedlings.
- **Foliar Application of Bt:** Apply **Bacillus thuringiensis (Bt) @ 1 ml per litre of water** at critical growth stages: **15, 30, 45, 60, and 75 DAT** to control lepidopteran larvae like the fruit borer.
- **Botanical Sprays:** Apply **Neem Oil (@ 4 ml/L of water)** or **Neem Leaf Extract (1 kg leaf in 10 L water)** as a foliar spray at frequent intervals: **20, 35, 50, 65, 80, 95, 110, 125, and 140 DAT**.
- **Foliar Application of UmBir:** Apply **UmBir (@ 10 ml/L of water)** at **25, 55, 85, 115, and 145 DAT**.
- **Foliar Application of UmComb:** Apply **UmComb (@ 10 ml/L of water)** at **40, 70, 100, 130, and 160 DAT**.
- **Release of Egg Parasitoids:** Release **Trichogramma chilonis** (egg parasitoids) cards/tubes to control the Shoot and Fruit Borer.
    - **Initiation:** Start releases **30 days after transplanting**.
    - **Frequency:** Repeat **5 times** at an interval of **8-10 days**.
    - **Dosage:** @ 1,00,000 parasitoids per hectare per release.

C. Mechanical / Physical Methods

These methods involve manual operations or physical devices to prevent pest establishment and spread.

- **Shoot and Fruit Removal:**
    - Regularly monitor and promptly remove and destroy plant shoots infested by the shoot and fruit borer (signs: drooping shoots). This disrupts its life cycle.
    - Conduct regular surveillance and promptly collect and destroy fruits exhibiting boreholes to prevent larval development.
- **Pheromone Traps:** Install pheromone traps with **Lucin Lure** (specific to brinjal shoot and fruit borer) **@ 12 traps per hectare** for monitoring and mass trapping of adult male moths.
- **Yellow Sticky Traps:** Use yellow sticky traps **@ 20 traps per hectare** to monitor and trap sucking pests like aphids, whiteflies, and leaf miners.
- **Light Traps:** Install **2 light traps per hectare** to attract and kill adult moths of various pests.
- **Bird Perches:** Install **T-shaped bird perches** (10 feet high with a 1-foot crossbar) **@ 50 per hectare** to provide resting spots for insectivorous birds.

D. Chemical Methods

These methods are a last resort and should be applied judiciously based on regular field scouting and Economic Threshold Levels (ETL).

- **Need-based Application:** Apply synthetic pesticides or fungicides only when absolutely necessary and pest/disease populations cross the ETL. Choose chemicals that are specific to the target pest and safer for natural enemies and pollinators.

Additional Important Practice

- **Soil Amendment:** Apply Agricultural Lime **@ 500 kg/ha once in three years**, ideally **21-30 days before sowing or transplanting**, to correct soil acidity and improve nutrient availability, leading to healthier and more resilient plants.

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