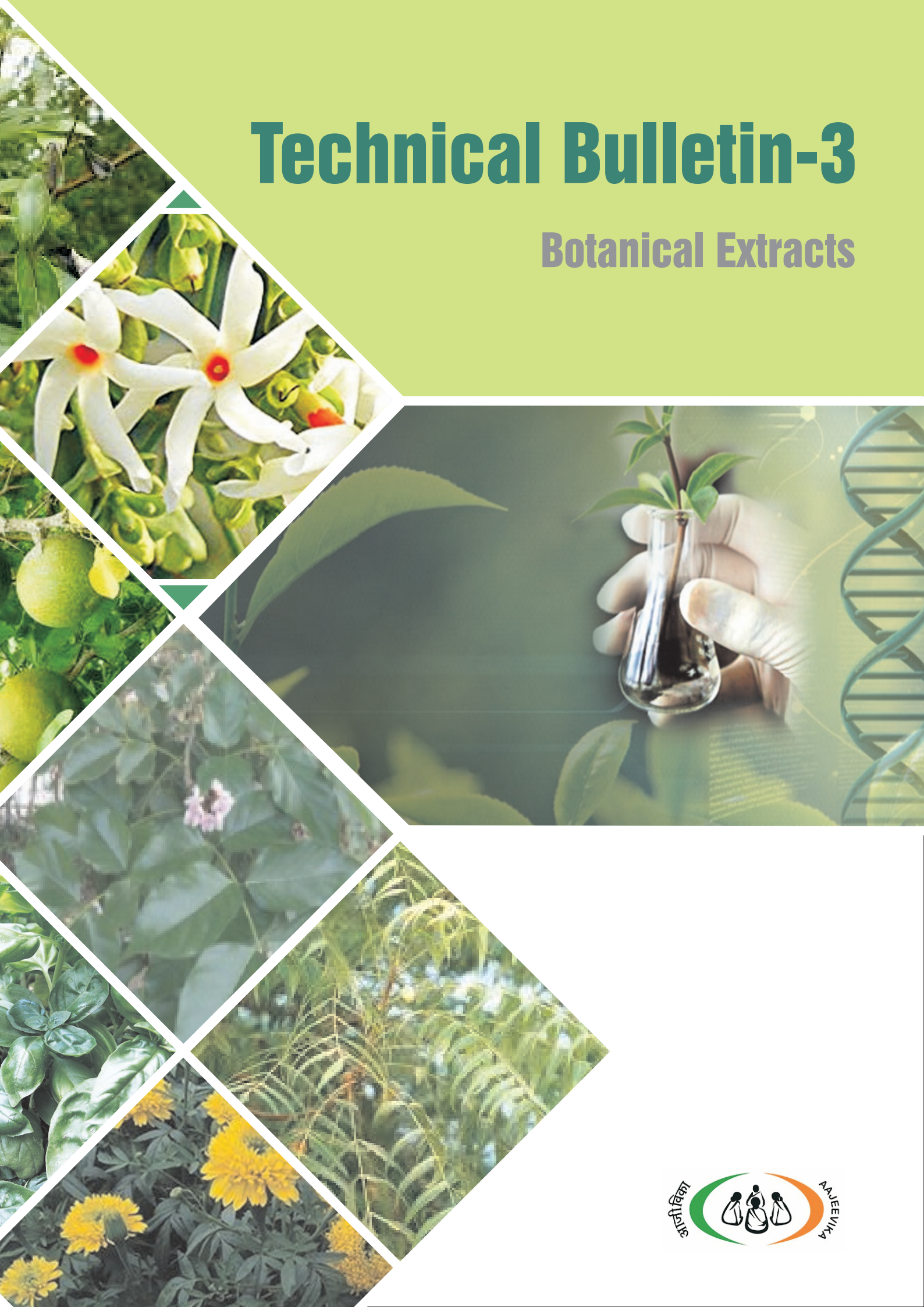


Technical Bulletin-3

Botanical Extracts



Technical Bulletin -3

Botanical Extracts



Contents

A. BOTANICAL EXTRACTS FOR SEED TREATMENT	7
1. Seed Treatment with Cow Urine	8
2. Seed Treatment for Improved Germination	8
3. Cow Milk	9
4. Cow Urine	9
5. Ash and Water	9
6. Red Cedar Leaf Extract for Seed Treatment	9
7. Microbial Seed Coating: Beejamrutham	9
8. Seedling Root Dip Treatment	10
9. Seed and Planting Material Treatment	10
B. BOTANICAL EXTRACTS FOR PEST MANAGEMENT	11
10. Cow Dung and Urine Solution	12
11. Tobacco Decoction	13
12. Vitex Decoction	13
13. Chilli-Garlic Solution	14
14. Dry Chilli -Garlic Solution	15
15. 5% Neem Seed Kernel extract	16
16. Neem Oil	17
17. Neem Powder	17
18. NPV Solution	18
19. Decoction of various leaves	18
20. Pest Repellent Decoction	19
21. Herbal Tea	20
22. Green chillies - Neem - Garlic - Tobacco Decoction	21
23. Soap Spray	21
24. Ginger Rhizome Extract	22
25. Custard Apple Leaf Extract	22
26. Neem Oil	22
27. Neem Leaf Extract	23
28. Garlic oil extract	23
29. Ginger, Garlic and Chilli Extract	23
30. Neem powdered seed extract	23
31. Milk spray	24
32. Flour spray	24
33. Yeast and water solution	24
34. Basil Leaf Extract	25

35. 5 Leaves Extract (Panchapatra Kashayam)	25
36. Agniastra: To control Pests and Diseases	26
37. Dashparni Extract	27
38. Liquid Herbal Pesticide	28
39. Soil Treatment	28
40. Foliar Treatment	28
C. DISEASE MANAGEMENT	29
41. Onion Bulb Extract	30
42. Compost Tea Spray	30
43. Mint Extract	30
44. Fermented Marigold Extract	31
45. Garlic Bulb Spray	31
46. Aloe and Vitex Extract	31
47. Baking Soda	32
48. Papaya Leaf Extract	32
49. Cow Dung – Urine Solution	33
50. Bourdeaux Mixture	33
D. DECOCTIONS FOR DISEASE MANAGEMENT	35
51. Bael (Aegio Marmolos) Decoction	36
52. Basil Decoction	36
53. Cow Dung -Urine – Asafetida Solution	37
54. Mohuva Decoction	37
55. Neem Leaf Decoction	37
56. Onion Decoction	37
57. Night or Coral Jasmine (Parijatham) Decoction	37
58. Thespesia (Thespesia Populnea)	37
59. Garlic Decoction	38
60. Pomegranate Waste Decoction	38
61. 10 % Vitex Decoction	38
62. 10 % Bael (Aegio Marmolos) Decoction	38
63. Eucalyptus or Lantana Chamera Leaves Decoction	38
64. Spraying of Botanical Oils	38
65. Brahmasthram	39
66. Neemasthram	39
67. Agniasthram	39
E. MANAGEMENT OF VIRAL DISEASES	41
68. 5% Neem Decoction	42
69. Cow Urine – Asetofida Decoction	42
70. Chilli and Coconut Leaf Solution	42

71. Lactic Acid Solution	42
72. Five Leaf Extract	43
73. Jatropha Leaf Extract	43
74. Beejamrutham	43
75. Panchagavya	44
76. EM Concoction (for Microbial Proliferation)	44
77. Fish – Jaggery Concoction (Aids in plant growth)	45
78. Vermiwash	45
79. 5% Pongamia Solution	46
80. N.P.V Virus Solution	46
81. Basil – Betel – Coral Jasmine Decoction	47
82. Turmeric Extract	47
83. Dried Ginger – Milk Decoction	47
84. Herbal Pesticide Solution	48
85. Buttermilk Solution to Control Leaf Spot Diseases	48
86. Bait Solution to Control Adult White Flies	48
87. Prakruthika Jeevasaram	48
88. Pancha Bana Kashayam (pesticide)	49
89. Extract for Plant Nutrition	49
90. Jeeva Jeebrallic Acid	49
91. Pongam, Aloe and Neem Extract	49
92. Custard Apple, Neem, Chilli Extract	50
93. Pongamia Leaf Extract	50
94. Garlic Extract	50
F. BOTANICAL EXTRACTS FOR SOIL FERTILITY MANAGEMENT	51
95. Soil Microbial Enhancement – Bio Stimulant “Ghanajeevamrutham”	52
96. Soil Microbial Enhancement – Liquid Biostimulant: Dravajeevamrutham	52
97. Panchagavya	53
98. Dasgavya	54
99. “Amrutha Jalam”	54
G. ON FARM PREPARATIONS FOR GROWTH PROMOTION AND PLANT PROTECTION	55
100. Sanjivak	56
101. Amirthapani	56
102. Concentrated Organic Manure	57
References	58
Photo References	58

A. BOTANICAL EXTRACTS FOR SEED TREATMENT



A. BOTANICAL EXTRACTS FOR SEED TREATMENT

1. Seed Treatment with Cow Urine

Required materials:

- Cow urine – 2 litres
- Cow dung: 1 Kg
- Mond or live soil: 1 Kg

Procedure:

Mix all the above mentioned materials with seeds and allow them for drying up to one hour.

Note: This method is suitable for the crops with seed rate of 30-60Kgs.

For e.g. Ground nut



2. Seed Treatment for Improved Germination

Soaking the seeds in water before sowing will improve the germination percentage. Duration of soaking depends on the nature of the seed coat. We can improve the disease resistance by soaking these seeds in cow urine.

Soaking time required:

- Paddy: 12 hours soaking in water and drying of seed under shade for 4-5 hrs
- Maize: 24 hrs
- Wheat: 7
- Ground nut: 1-2 hrs



3. Cow Milk

For any variety of seed sprinkling of cow milk and water mix with 1:9 ratio and drying under shade will be beneficial



4. Cow Urine

Seed treatment with cow urine (1 or 2 litres for 100 Kg of seed) and drying under shade

5. Ash and Water

Sprinkling of ash and water and drying under shade

6. Red Cedar Leaf Extract for Seed Treatment

Pound 1 kg of red cedar leaves. Soak the pounded leaves in equal amount of water overnight. Strain to get a clear filtrate. Treated seeds should be sown immediately.



7. Microbial Seed Coating: Beejamrutham

Required Materials

- Cow Dung: 2 kg
- Cow Urine: 2 Litres
- Lime: 40 grams
- Handful of Chemical Free Soil
- Water: 20 Litres



Procedure

- Wrap the cow dung in a cloth and submerge in water and let it soak for 12 hours
- Squeeze the cloth. After 12 hours, add lime, chemical free soil. Mix well in clock wise direction
- Spray the concoction on all seeds and ensuring each seed is coated by it before sowing

8. Seedling Root Dip Treatment

Add 1-2 kg Azotobacter / Azospirillum and PSB into 5-10 litres of water. Dip the roots of the seedlings in the suspension for 20-30 minutes before transplanting. For Paddy, make a bed (2mt x 1.5mt x 0.15mt) in the field, fill it with 5 cm of water and add 2 kg each of Azospirillum and PSB and mix.



9. Seed and Planting Material Treatment

- Use Disease Free Seed and Resistant Varieties
- Hot water treatment at 53C for 20-30 minutes
- Trichoderma Viride (4gm/kg seed) or Pseudomonas Fluorescens (10gm/kg seed)
- Turmeric powder mixed with cow urine



B. BOTANICAL EXTRACTS FOR PEST MANAGEMENT

B. BOTANICAL EXTRACTS FOR PEST MANAGEMENT

10. Cow dung and urine solution

Large number of microbes present in the cow dung and urine which are useful for controlling many fungal diseases. Nutrients present in the solution are useful for effective plant growth. This can be applied for two to three in a crop period

Required materials

- Cow dung – 5 Kgs
- Cow urine – 5 litres
- Lime – 150 gm

Preparation:

- Store 5 Kg cow dung, 5 litres of cow urine and 5 litres of water in a tub
- Cover the tub and allow the solution for fermentation for 4 days
- Stir the solution with a stick every day
- After 4 days filter the solution and add 150 gm of lime to it
- Add 100 litres of water to the solution to spray it in 1 acre

Precautions:

- As this solution is thick use a mesh or gunny bag to filter the solution (first time)
- After that add water and filter through a thin cloth
- We can store the solution for 1 or 2 days (farmers experience)

Note:

- This solution will improve the resistance power of the crops
- Spraying of this solution will improve the drought resistant capacity

11. Tobacco Decoction

- Nicotine in Tobacco controls the pests through contact
- Tobacco decoction can be used against Whitefly

Required material:

- Tobacco wastes – 1 Kg
- Soap powder – 100 gm

Preparation:

- Boil 1Kg Tobacco waste in 10 litres of water for 30 minutes
- Let the decoction cool and filter it through a thin cloth
- Add 1000 litres of water to the above decoction, it is sufficient for 1 acre and apply it in the evening time.

Precaution:

- Tie a cloth to nose while making the decoction
- Cover entire body while spraying
- Apply only once on a crop, otherwise friendly insects may die
- *Never store the decoction



12. Vitex Decoction

The presence of many Alkaloids makes vitex an effective pesticide and fungicide

Required materials:

- Boil 5Kg of Vitex in 10 litres of water for 30 minutes
- Stir the boiling solution regularly
- Make the solution cool and filter through a thin cloth
- Add 100 gm Detergent to the decoction
- Add 100 litres of water to the decoction to spray in 1 acre
- Spray the decoction in the evening time

Precaution:

- Tie a cloth to nose while making the decoction
- Depending on the crop stage and pest intensity, this can be applied for two to three times
- Never store the decoction
- We can also make a decoction with leaves of custard apple. This decoction also effectively works against the above mentioned pests



13. Dry Chilli-Garlic Solution

Alkaloids viz Capsaicin and Allesis present in chillies and garlic will act through contact. These will create tingling to the insect and insect will fall from the tree and die

Materials required:

1. Green Chillies - 3 kg
2. Garlic - ½ kg
3. Kerosene – 250 ml
4. Detergent – 100 gm

Methodology:

- Grind the chillies after removing the petioles and add 10 litres of water to it. Keep this solution throughout the night.
- Grind the 1/2 kg garlic and add 250 ml kerosene and keep it for a night
- Next day morning filter the chilli solution through a thin cloth
- Do the same for garlic solution
- Mix chilli solution, garlic solution and detergent powder thoroughly and make a mixture
- Add 100 litres of water to the above solution. This can be applied for one acre

Precaution:

- Apply oil to your body while preparing this decoction
- Cover your body while spraying
- Apply this solution only one or two times in a cropping season
- Don't store the solution



14. Dry Chilli –Garlic Solution

Required materials:

- Dry chillies – 1 kg
- Garlic – 1 kg

Preparation:

- Grind 1 kg dry chillies and add 5 liters of water and keep the solution over night
- Take one kg of garlic (remove top layer) and grind it to make paste and add 5 liters of water and keep it over night
- Next day mix the two solutions and filter it through a thin cloth
- Keep the mixture for four hours and add 100 litres of water
- This can be sprayed on one acre of Paddy field

Precaution:

- This decoction can be applied only twice in a crop period
- Don't store the decoction, spray immediately
- This is effective against rice Gundhi bug
- Apply oil to the body while preparing the solution
- Cover the entire body while applying this decoction

15. 5% Neem Seed Kernel extract

“Azadiractin” present in the Neem will affect on different stages of the pest life cycle. It will act through stomach and contact

Required materials:

- Neem seeds – 5 kg
- Detergent – 100 gm

Preparation:

- 5 kg of Neem seeds dried under shade with good quality can be powdered
- This powder can be packed in cloth and keep in 10 litres of water for 10-12 hrs
- Extract the decoction by pressing the cloth pack for 10-15mints
- Filter this solution through a thin cloth
- Add 100 gm of surf to the filtered solution
- Add 100 litres of water to the solution and spray it in 1 acre during evening time

Note:

- 10-15Kg of Neem powder is required (depending on the crop stage and pest intensity)
- Shouldn't store the solution
- Depending on the crop stage and intensity increase the dosage
- This solution can be used in all crops and nurseries
- This solution can be used in orchards to get better yields
- Instead of det we can use soap nut of 500 gm

Uses of Neem Seed Kernel Extract:

- It affects egg and larva stages. Larvae can feed on the leaves, as the leaves tastes bitter
- “Azadiractin”, which is present in the Neem, affects the lifecycle of the pests. The pest will die as larvae or pupae
- This solution will not affect human health, friendly insects and environment



16. Neem Oil

Generally Neem oil is available in the market. Pure Neem oil can be used in pest control. 5% solution of Neem oil is effective in pest control (5 ml of Neem oil in 1 litre water and 100 litres of solution can be used for one acre). As Neem oil is insoluble in water, make 100 grams of detergent solution and add to this solution. This will act as spreading agent. Depending on pest intensity spray 100-150 litres of solution.



Pests that can be controlled:

Sucking pests, fruit borers and leaf folders can be controlled with this solution.

17. Neem Powder

Neem powder or Neem cake can be obtained after extracting Neem oil. Neem powder contains 5.2% to 5.6% of Nitrogen, 1.1% of Phosphorus, 1.1% of Potash. 1-2 quintals of Neem cake can be applied in 1 acre. It is effective against soil born pests. It can be applied at the time of ploughing. It can be applied before sowing the seeds in nurseries

Pests to be controlled:

- Soil born nematodes and root grubs

Precautions for storing Neem seeds:

Do's	Don'ts
Collect ripened and dropped fruits in June and July	Don't store the seeds more than one year
Remove seeds from fruits regularly	Don't dry under sun light
Dry the seeds under shade	Don't store in polythene bags
Store the seeds in gunny bags	

Note: If seeds are stored in large quantities add Sulphur and lime and in 1:10 ratio of 500 grams per quintal

18. NPV Solution

Pests to be controlled:

Three types of virus are existing now:

- Against helioverpa – HNPV
- Against Spodoptera – SNPV
- Against Red hairy caterpillar – RHNPV

How it works:

Pests affected by NPV will die. The pests affected by NPV will die in a reverse direction (head looking downwards). Collect these insects and grind them. This mixture will consist of NPV. Spraying of this mixture on crops will spread the virus among the pests. In this way the virus will spread.

Precaution:

- This solution can be sprayed 1-2 times in crop period, based on the intensity of pest incidence
- Select the proper Virus
- Dosage for HNPV is 250 LE, for spodoptera it is 100 L.E and for Red hairy caterpillar it is 200 L.E
- Store this mixture in cool place or in refrigerator

19. Decoction of various leaves

Required material:

- Neem leaves – 1 Kg
- Jatropha – 1 Kg
- Vitex – 1 Kg
- Custard apple – 1 Kg
- Mint – 1 Kg
- Eucaluptus – 1 Kg
- Lantena – 1 Kg



Preparation:

- Take any 5 types of leaves from the above mentioned
- Keep all these leaves in a pot and add 10 liters of water
- Keep them for whole night
- Next day boil the water
- Keep on stirring the solution and boil the water until the solution become 5lits
- After making it to 5 litres allow it to become cold
- Filter the solution and add 100 gm of detergent
- Mix this solution to 100 -150 litres of water to spray in one acre

Pre-caution:

- Add 0.5 litres of decoction to 10 litres tank
- Add 0.75 litres of decoction to 15 litres tank

Pests to be controlled:

- Sucking pests
- Small larvae
- Grass hoppers
- Fruit borers

How to use:

- This decoction can be applied to once in one acre
- This can be used in all crops
- Based on the intensity of pest it can be used for one – two times in a crop period

Precaution:

- Cover your nose with a cloth while preparing the solution
- For effective results spray this solution during evening time
- Don't store the solution
- Don't spray this solution during early stages of the crop
- Don't spray this solution on nurseries

How it works:

- Presence of different alkaloids make this decoction effective in pest control

20. Pest Repellent Decoction

Required material:

S. No	Name of the leaf	Quantity
1	Neem	250 gm
2	Tobacco	250 gm
3	Bougan villea	250 gm
4	Teak leaves	250 gm
5	Alloevera	250 gm
6	Papaya	250 gm
7	Cow urine	5 ltr

Preparation:

- Grind the above mentioned leaves
- Add 5 litres of cow urine and 2 litres of water to the mixture
- Keep the pot with cover and stir the solution with a stick for 10 days
- Filter the solution after 10 days through a thin cloth
- Add 100 liters of water to the solution and spray it on one acre of land

21. Herbal Tea

- Take 5 kg leaves mentioned in pest repellent decoction and grind them
- Add 5 kg of cow dung and 100 gm of Jaggery
- Take this solution into a pot and stir it with a stick regularly for a week
- After a week herbal tea is ready. Add 5 liters of water and filter the tea through a thin cloth
- Add 100 litres of water to the mixture and spray it on one acre

22. Green chillies – Neem – Garlic – Tobacco Decoction

Presence of alkaloids makes this decoction effective in pest control. This decoction is affective against helioverpa, spodoptera and red hairy cater pillar

Required materials:

- Neem leaves – 2 Kgs
- Tobacco wastes – 1 Kg
- Garlic – 1 Kg
- Green chillies – 1 Kg
- Cow urine – 5 lits

Preparation:

- Grind all the above mentioned materials except tobacco wastes
- Add tobacco wastes to the mixtures and add 5 litres of cow urine and store it for 10 days
- Stir the solution every day
- Filter this solution after 10 days and add 100 litres of water and this can be sprayed in 1 acre of land

Precaution:

- This can be applied on 1-2 times during a crop period to get maximum benefits
- Don't store the solution
- Apply oil to your body while preparing the solution
- Cover your body while spraying the solution

23. Soap Spray

Method of preparation:

Mix 2½ tbsp of liquid soap to a soap spray. Stir well. Another method is to mix 1 tbsp of dishwashing detergent with 1 cup of cooking oil, to make a stock solution. For a gallon of spray, add 5-8 tbsp of stock solution to a 4 lts of water .

Pests controlled:

- Ants
- Leafhoppers
- Mealy bugs
- Psyllids
- Scales
- Spider mites
- Thrips
- Whiteflies and
- Plant diseases



24. Ginger Rhizome Extract

Grind 50 gm of ginger and make into paste. Mix with 3 liters of water. Add 12 ml of soap. Mix well. Ten (10) kg of ginger is needed for 1 ha. This spray also controls plant hoppers and thrips.



25. Custard Apple Leaf Extract

Boil 500 g of leaves in 2 liters of water until the remaining liquid is about ½ liter. Dilute and filter with 10-15 liters of water. This spray material also controls other caterpillars



26. Neem Oil

Method of preparation:

Add 30 ml of neem oil into 1 liter of soapy water. Constantly shake the container or stir the extract while in the process of application to prevent oil from separating.

Pests controlled:

- Flea beetles
- Gall midge
- Leafhoppers

27. Neem Leaf Extract

Method of preparation:

Pound gently 1-2 kg of neem leaves. Place in a pot. Add 2-4 liters of water. Cover the mouth of the pot securely with the cloth and leave it as such for 3 days. Strain to get clear extract. Dilute 1 liter of neem leaf extract with 9 liters of water. Add 100 ml of soap. Stir well.



Pests controlled

- | | |
|---------------------------|-----------------|
| • Aphids | • Plant hoppers |
| • Colorado potato beetles | • Scales |
| • Grasshoppers | • Snails |
| • Grubs | • Thrips |
| • Japanese beetles | • Weevils |
| • Leafhoppers | • Whiteflies |
| • Locusts | |

28. Garlic oil extract

Method of preparation

Chop finely 100 g of garlic. Soak the chopped garlic in mineral oil for a day. Add ½ liter and 10 ml of soap. Dilute filtrate with 10 liters of water. Constantly shake the container or stir the extract while in the process of the application to prevent oil from separating.

Pests controlled:

- Leafhoppers
- Imported cabbage worm
- Squash bugs
- Whiteflies



29. Ginger, Garlic and Chilli Extract

Method of preparation:

Soak 50 grams of peeled garlic overnight in 10 ml mineral oil. Combine garlic, 25 g of green chilies, and 25 g of ginger. Grind them. Add 50 ml of water to the mixture. Add 3 liters of water.

Pests controlled:

- Aphids
- Armyworm
- Cotton bollworm
- Caterpillars
- Corn earworm
- Fruit borers
- Leafminers
- Shoot borers
- Thrips
- Tomato fruitworm
- Whiteflies



30. Neem powdered seed extract

Method of preparation

Add 50 grams of powdered kernel in 1 liter of water. Let it stand for 6 hours but not more than 16 hours. Add soap and stir. Constantly shake the container or stir the extract while on the process of application.

Pests controlled

- Aphids
- American bollworms
- Cotton leaf rollers
- Diamondback moths
- Grasshoppers
- Leafhoppers
- Leafminers
- Red locusts
- Mexican bean beetles
- Whiteflies

31. Milk spray

Method of preparation

Mix ½ liter of milk to 4.5 liters of water (Milk and water ratio is 1 part milk to 9 parts water). Spray at weekly interval as a preventive control measure.

Pests controlled

- Spider mites
- Mildews
- Mosaic virus
- Leaf blights
- Fungal diseases

32. Flour spray

Method of preparation

Add 2-4 tbsp of wheat or potato or any baking flour into 4 cups of warm water. Add 1 tsp of soap as sticker. Stir the filtrate prior to application.

Pests controlled

- Aphids
- Spider mites
- Thrips
- Whiteflies

33. Yeast and water solution

Dissolve 1 tbsp of yeast in 100 ml of water. Fill any shallow container with the solution. Bury up to the rim near the plant. Make some modifications to cover your trap to avoid non-target pests from entering. The snails drink, get drunk and drown in the pan. Monitor the pans and the trapped snails. Change the solution when necessary, especially after rain.

34. Basil Leaf Extract

Method of preparation:

Grind leaves 50 g of basil leaves Soak overnight in 2-3 liters of water Strain Add 8-12 ml soap. Stir well

Pests controlled

- Caterpillars
- Fruit flies
- Red spider mites
- Red scales
- Spotted leaf beetles
- Fungal diseases
- Nematodes



35. 5 Leaves Extract (Panchaparni)

Materials Required

- 10 litres desi cow urine
- 3 kg crushed neem leaves
- 2 kg custard apple leaves
- 2 kg papaya leaves
- 2 kg guava leaves
- 2 kg pomegranate leaves

Method of Preparation

- Boil solution till it reaches 50% volume
- Keep it for 24 hrs
- Filter using cloth and store it in cans or bottles
- Spray against sucking pests, pod borers and fruit borers.
- (2 lit/100 lit water)

36. Agniastra: To control Pests and Diseases

Materials Required

- Cow urine 10 litre
- Ipomea leaves 1kg
- Green chillies 500 gm
- Garlic 500 gm
- Ginger 500 gm
- Neem leaves 5 kg.

Method of Preparation

- Grind the above and mix with 10 litres of cow urine and boil for 2-5 times.
- Keep it for 24 hrs.
- Filter it with cloth.
- Store it in glass bottle and use it by mixing with water to control pests and diseases.



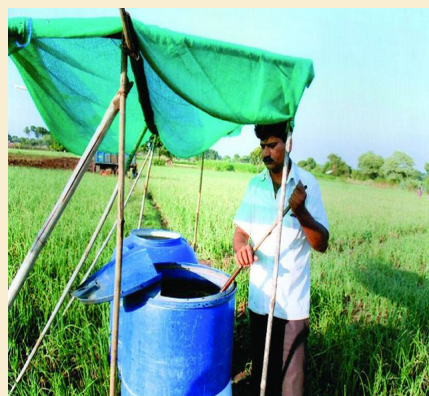
37. Dashparni Extract

Materials Required

- Neem Leaves 5 kg
- Vitex Negundo 2 kg
- Aristolochia 2kg
- Papaya 2 kg
- Custard Apple 2kg
- Castor 2 kg
- Nerium Indicum 2 kg
- Calotropis 2kg
- Green Chilli Paste 2 kg
- Garlic Paste 250gm
- Cowdung 3kg
- Cow Urine 5 litres

Method of Preparation

- Crush all the above ingredients and ferment in 200 litres of water
- Keep the drum in shade covered with gunny bag
- Stir regularly
- Squeeze the extract
- Sufficient for 1 acre



(For Pest and Disease Prevention)

38. Liquid Herbal Pesticide

Materials Required

- Leaves of Neem 10 kg
- Leaves of Ipomea 10 kg
- Leaves of Lantana 10 kg
- Leaves of Dhatura 10 kg
- Leaves of Calotropis (Aak) 10 kg
- Cow dung 5kg
- Cow Urine 5 Litres
- Sour Buttermilk 5 Litres
- Besan Powder 5 grams
- Jaggery 5 grams
- Garlic 1 gram
- Undisturbed Soil 5 grams

Method of Preparation

- Keep it in a 200 litres drum and fill it with water.
- Stir 2 times/ day and cover with gunny cloth.
- Herbal pesticide will be ready in 20-25 days.
- Mix with water and spray on crops.

39. Soil Treatment

- *T.viride*, *T.harzianum*, *P.flourescens* and *B.subtilis* can be used for soil treatment.
- For Nursery bed, mix 500 gm of elected biopesticide in water and drench the bed.
- For main field, mix 4-5 kg of bio pesticide in 300-400 kg compost and cover it for 12 hr. and apply.
- In termite infested soil, drench *Metarhizium anisopliae* solution.

40. Foliar Treatment

- *Metarhizium anisopliae*, *Veticillium lecanii*, *Beauveria bassiana* and NPV are used.
- Required biopesticide is mixed with 200 lit of water and sprayed
- Khadhi Soap may be used as sticker.

C. DISEASE MANAGEMENT

The image features two red onions with their roots exposed, resting on a bed of soil. The onion in the foreground is in sharp focus, showing its deep red, papery skin and a cluster of light-colored roots. A second onion is visible in the background, slightly out of focus. The entire scene is overlaid with a semi-transparent green filter, and the text 'C. DISEASE MANAGEMENT' is centered in white, bold, sans-serif font.

C. DISEASE MANAGEMENT

41. Onion Bulb Extract

Method of preparation

Finely chop 50 g bulb onion. Add to 1 liter of water

Diseases controlled:

- Alternaria
- Anthracnose
- Fusarium wilt
- Fungal leaf blight



42. Compost Tea Spray

Method of preparation

Put a (4 liters) of well-matured compost into a 5 (20 liters) container. Add water until the container is full. Stir well. Place in warm place for 3 days to ferment. Strain.

Diseases controlled

Fungal diseases

43. Mint Extract

Method of preparation

Grind 250 g of mint leaves Make into a paste Add 2 liters of water. Stir well and ready for use or strain it to have a clear extract

Diseases controlled

- Bacterial leaf spots and other bacterial diseases



44. Fermented Marigold Extract

Method of preparation

Fill a container with $\frac{1}{2}$ - $\frac{3}{4}$ of flowering plants. Leave to stand for 5-10 days. Stir occasionally. Strain Dilute filtrate with water at a ratio of 1:2

Diseases controlled

- Tomato blights
- Rice blast
- Coffee berry disease



45. Garlic Bulb Spray

Method of preparation

Grind 2 garlic bulbs. Add to 4 cups of water and stir in few drops of soap. Dilute 1 part of this filtrate with 9 parts of water.

Diseases controlled

- Black spots
- Blights
- Fruit rots
- Mites

46. Aloe and Vitex Extract

Method of preparation

Soak 5 kg of vitex leaves in sufficient amount of water and then bring to boil for 30 minutes and strain. Add 2 liters of aloe vera juice. Stir in 50 ml of soap. Add 50 liters of water.

Pests controlled

- Bacterial and fungal diseases
- Armyworm
- Hairy leaf-caterpillar
- Rice leaf roller
- Rice stem borer
- Semi-looper

47. Baking Soda

Method 1

Mix 1 tbsp of baking soda and 1 tbsp of dormant oil or vegetable oil. Add 4 liters of water. Stir well. Add ½ tbsp of dish washing liquid soap. Stir it again

Method 2

Dissolve 1 tbsp of baking soda in 4 cups of warm water. Add 1 tsp of liquid soap. Stir well

Method 3

Mix 1 tbsp of baking soda and 2 ½ tbsp of vegetable oil. Add 4 liters of water. Stir well

Diseases controlled

Powdery mildew, blackspot, and other fungal diseases

48. Papaya Leaf Extract

Method of preparation

Soak 50 g of finely shredded leaves in 1 liter of water. Let it stand for 1 night. Squeeze the extract and strain. Add 2-3 liters and 10 ml soap as adhesive.

Diseases controlled

- Leafy caterpillars
- Coffee rust
- Leaf rust
- Mosaic virus
- Powdery mildew



49. Cow Dung – Urine Solution

Materials Required

- Cow Dung 5 kgs
- Cow Urine 5 litres
- Lime 150 grams

Method of Preparation

- Store 5Kg cow dung, 5 litres of cow urine and 5lts of water in a tub
- Cover the tub and allow the solution for fermentation for 4days
- Stir the solution with a stick every day
- After 4days filter the solution and add 150grs of lime to it
- Add 100lts of water to the solution to spray it in 1 acre
- We can store the solution for 1 or 2 days

Precautions

- As this solution is thick use a mesh or gunny bag to filter the solution(first time)
- After that add water and filter through a thin cloth
- We can store the solution for 1 or 2 days

Note

- Spraying of this solution will improve the drought resistant capacity

50. Bourdeaux Mixture

- Add copper sulphate 1 kg in 10 litres of water and stir it.
- Add hydrated lime 1 kg in 10 litres of water and stir it.
- Add copper sulphate solution to lime solution.
- Mix the above 20 lit solution in 80 litres of water and use it as foliar spray.





D. DECOCTIONS FOR DISEASE MANAGEMENT

D. DECOCTIONS FOR DISEASE MANAGEMENT

51. Bael (Aegio Marmolos) Decoction

Presence of many alkaloids in bael leaves will help in disease management. This decoction is effective in control of blast and sheath blight in Paddy



Required materials

- Bael leaves – 5 Kg
- Detergent – 100 grs

Preparation

- Take 5Kg of Bael leaves and boil them in 10 litres of water for 30 minutes and stir it with a stick regularly. Filter the solution after cooling the solution. Add 100grs of detergent. Add 100 litres of water to the solution and spray the solution in one acre during evening time

Precaution

- This decoction can be used 1-2 times during a crop period. Spray the decoction on the field immediately after preparation. Don't store the solution. Cover your nose with a cloth while preparing the decoction

52. Basil Decoction

Presence of Alkaloids in Basil makes it effective in disease management. This decoction is effective against leafspots and alternaria leaf spots.

Required materials

- Picchi thulasi (Basil) leaves – 5 Kgs
- Detergent – 100 grams

Preparation:

- Take 5Kg of Basil leaves and add 10 liters of water and boil it for 30 minutes
- Stir the solution regularly
- Make the decoction cold and filter it through a thin cloth
- Add 100 grams of detergent
- Add 100 litres of water and spray it in the evening

Precaution:

- This decoction can be sprayed only 1-2 times during a crop period
- Don't store the decoction

53. Cow Dung -Urine – Asafetida Solution

Mixing of 200grs of Asafoetida in cowdung and urine make it strong fungicide. This solution is effective against Blast in Paddy. It is also effective against Bacterial diseases in Paddy. Presence of Sulphor in Asafoetida make this solution as fungicide.

54. Mohuva Decoction

Mohuva nuts are available in plenty in our forests. These nuts will play a key role in disease management. Presence of many alkaloids in Mohuva makes it a fungicide. This decoction prevents growth of fungal hyphae and prevents spread of diseases.

55. Neem Leaf Decoction

Take 10Kg of neem leaves and grind them and take juice from these leaves and add soap nut solution to it. This decoction is affective against alterneria leaf spot.

56. Onion Decoction

Presences of many alkaloids will help in controlling diseases. This decoction prevents growth of fungal hyphae and germination of fungal spores.

57. Night or Coral Jasmine (Parijatham) Decoction

Decoctions from this flower are effective in controlling Bacterial diseases.



58. Thespesia (Thespesia Populnea)

This decoction is effective against Rhijoctenia rot. This decoction prevents growth of this fungus.



59. Garlic Decoction

Take ½ Kg of Garlic and grind them and keep this in a thin cloth in a container with 250ml of Kerosine. Keep this overnight. Take some water in another vessel and press this garlic to extract the decoction. Add 100litres of water to this and spray it in one acre. Presence of Allosine (alkaloid) will help in preventing diseases.

60. Pomegranate Waste Decoction

Take one Kg of Pomegranate wastes and grind them. Decoction from these wastes is effective against Paddy blast. This prevents growth of fungal hyphae.

61. 10 % Vitex Decoction

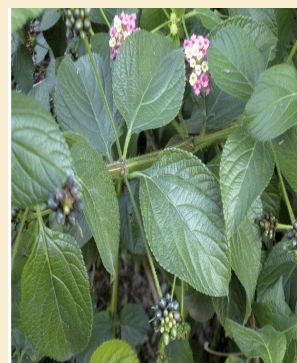
Take 10Kg of Vitex leaves and boil it for 30mints and make it cool. Add some soap nut solution to it. Add 1000 – 150 litres of water to it and is can be used for one acre. This will prevent many diseases in Paddy and other crops.

62. 10 % Bael (Aegio Marmolos) Decoction

Take 10Kg of bael leaves and boil it and then filter it. After filtering add some soap nut solution. This decoction can be added to 100-150 litres of water to spray on one acre. This decoction is effective against Blast in Paddy.

63. Eucalyptus or Lantana Chamera Leaves Decoction

Take 10 Kg of Eucalyptus leaves or Lantana Chamera leaves and boil the leaves in 15 litres of water. Keep the boiled solution over -night and add 150 litres of water to spray it in one acre of land. This decoction can be stored upto 15 days by adding 1 Kg Jaggery. This decoction can be used in many diseases.



64. Spraying of Botanical Oils

Neem oil or Jatropa oil can be used in management of many diseases. These oils spread like a layer over the leaves. Fungal hyphae germinate through these layers and they will die as they are unable to penetrate into these layers. These oils reduce the moisture content on the leaves and create an adverse condition for fungal spores to germinate.

65. Brahmasthram

Required Material

- Cow urine 10 to 15 liters
- Neem leaves 3 kgs
- Custard apple leaves 2kgs
- Castor leaves 2kgs
- Pomgamia leaves 2kgs
- Lantana leaves 2kgs
- Papaya leaves 2kgs
- Datura leaves 2kgs
- Guava leaves 2kgs
- Bitter gourd leaves 2kgs

Preparation

- Take any of the five varieties leaves of mentioned above
- Take 10 -15 ltrs of cow in a vessel
- Grind any of the 5 leaves separate leaves
- Add these in to the vessel and boil them for 5 times.
- Allow it to cool for 48 hours
- Then add 2 to 2.5 ltrs of brahmasthram to 100 liters of water to spray on once acre.

66. Neemasthram

Used against small and sap sucking pests Mix 5 Kg of ground Neem leaves or 5 Kg of dry leaves or fruits into 100 L water. Add 5 L cow urine and 1 kg cow dung to this mixture and mix well. Let it ferment for 24 hrs and filter through a cloth. Spray in the fields.



67. Agniasthram

Used against stem and fruit borers Take 10 L cow urine in a big container. Add 1 Kg ground Tobacco leaves, 5 Kg ground Neem leaves, 1 or 2 Kg of ground green chillies, ½ Kg ground Garlic and boil till it simmers. Let the contents cool for 48 hours. Filter through a cloth and mix 2- 3 L of the decoction with 100 L of water before spraying in the field.



E. MANAGEMENT OF VIRAL DISEASES

E. MANAGEMENT OF VIRAL DISEASES

As many viral diseases spread through vectors the best way to prevent viral diseases is control of vectors. To prevent viral diseases, in addition to integrated disease management methods following methods are also important.

68. 5% Neem Decoction

Spray 5 % neem decoction immediately after observing symptoms of viral diseases. In addition to spraying neem decoction removal of the affected plants is recommended.

69. Cow Urine – Asetofida Decoction

To control sucking pests spray solution of 4 litres of cow urine and 100 grams of Asetofida and 100 grams of calcium. This will prevent spread of viral diseases.

70. Chilli and Coconut Leaf Solution

Take 3 Kg of green chillies and 2 Kgs of coconut leaves and grind them to make paste. Keep this paste whole night in a cloth. Next day morning extract the solution in water. This solution can be sprayed in Tomato crop against spotted wilt virus.

71. Lactic Acid Solution

Presence of many microbes in the materials used in this solution will help in controlling many diseases (both viral and fungal)

Required materials

1. Biyyam kadugu - 5 litres
2. Cow milk – 10 litres
3. Jaggery – 1 Kg

Preparation:

- Keep 5 liters of Biyyam kadugu in a pot and keep it for 7 days
- After 7 days add 10liters of cow milk
- Cover the pot and Keep this mixture for 7 days under shade
- Filter this solution and add Jaggery powder to this solution
- Stir the solution with a stick regularly
- Filter the solution and add 100litres of water to spray it in one acre

Precaution:

- This solution can be used in all crops and orchards
- For effective resulitres spray 1-2times in a crop period
- Don't store the solution

72. Five Leaf Extract

This extract is prepared using the leaves of five different plants. Leaves with the characteristics described below can be used for the purpose

- Plants with milky latex – e.g., calotropis, nerium, cactus and jatropa.
- Plants which are bitter – e.g., neem, andrographis, tinospora and leucas.
- Plants that are generally avoided by cattle – e.g., Adhatoda, Ipomea fistulosa.
- Aromatic plants – e.g., vitex, ocimum.
- Plants that are not affected by pests and diseases – e.g. morinda, Ipomea fistulosa.

Any five of the above mentioned plant leaves should be collected in equal quantities (1 kg of each) and pounded well. Transfer this to a mud pot and add two times (10 litres) the quantity of water. To this add one litre of cow urine and 100 gm of asafoetida. Tie the mouth of the pot tightly with a cloth. The extract should be mixed well daily every evening and used after a week after filtration. Cow urine is used for disease control and asafoetida prevents flower dropping, enhancing the yield.

73. Jatropa Leaf Extract

Collect 12.5 kg of jatropa leaves, pound and place in a mud pot. To this, add 12.5 litres of water and allow to ferment for 3–7 days. Filter and use the extract for spraying (after diluting with 10 parts of water) for one hectare area.



74. Beejamrutham

Ingredients

- Cow dung 5 kg
- Cow urine 5 litres
- Cow milk 1 litres
- Lime 250 gm
- Water 100 litres

Preparation

Mix all the ingredients and keep overnight. Sprinkle the formulation on seeds to be sown, then dry in the shade before sowing.

75. Panchagavya

Panchagavya is a growth regulator produced from a combination of five products obtained from the cow along with a few other bioproducts. Collect fresh cow dung (5 kg), mix it with ghee (1 litre) and keep it in a plastic barrel separately for three days. On the same day, mix the other ingredients, namely cow urine (three litres), cow's milk (two litres), curd (two litres), yellow banana (400 gm, without skin), coconut water (three litres), jaggery (one kilo dissolved in three litres water) in a plastic barrel separately. Filter the jaggery solution before adding it to the other ingredients. On the third day, mix the contents of both the barrels and leave them aside for seven days. Stir the contents with a wooden stick twice a day. After seven days, filter the product with a khada or terracot (TC) cloth and store it in closed containers. (Pierce small holes in the cap of the containers to prevent bursting.) This is diluted @ 300 ml/10 litres water and sprayed.

76. EM Concoction (for Microbial Proliferation)

Required Material

- Ripened Bananas' 3 Kg
- Papaya (Deseeded) 3 Kg
- Pumpkin (Gummadi- peel off skin 3 Kg
- Coconut water 300 ml
- Eggs 2
- Water 10 Liters

Method of Preparation:

Mix ripened bananas, papaya and pumpkin in a pot. Add 10 liters of water, 2 eggs and 300 ml of coconut water to the mixture. Cover the pot with a cloth and leave it for 45 days in a shade. Mix the contents in between. Add 5 liters of water to this concoction and filter it through a muslin cloth. This mixture can be added to 100 liters of water and spray in 1 acre of land.

Details:

This mixture has lot of microbes in it which will help in enhancing the soil nutrients and hence aiding in proper plant growth. This mixture can be sprayed 1-2 times.

77. Fish – Jaggery Concoction (Aids in plant growth)

The amino acids produced by microbes in this mixture aids in plant growth.

Required Materials

- Fish scraps (bones, gills, skin etc) 1 Kg
- Jaggery 1 Kg

Method of Preparation

Mix 1 kg of fish waste and 1 kg jiggery with water. Place it in a pot and tie it with a cloth. Let the contents ferment for 10 days.

Mix the contents well. After 10 days, filter the mixture and mix with 100 liters of water. This can be used as a spray on plants.

Suggestions

- Efficient if sprayed for 1-2 times on plants
- Can be used in all crops including orchards
- This concoction cannot be stored and should be used immediately after fermentation.



78. Vermiwash

Take 10 lit of mud pot or plastic container for preparation of vermiwash. Arrange a tap for it at the bottom. Then place 10 cm gravel or broken bricks at the bottom. Spread coconut husk upto 4 cm. on this. Place partially decomposed agricultural waste material and dung and moisten the material with water. After wetting the material for 2 days, release two dozen earthworms. In 2 weeks the wastes get transformed into black compost. At this stage pour 3 litres of water. After 24 hrs, 2 litres Vermiwash can be collected through the tap. Continue this method for one week, remove the compost from the container and it can be used as manure. Again refill the container as explained above and prepare vermiwash.

Method of application:

- 10 lit. Vermiwash is mixed in 100 liters of water and sprayed on an acre of crop.
- Vermiwash can be used on all crops, nurseries and fruit crops.
- Can be sprayed 1-2 times during crop duration to get good results
- By spraying Vermiwash controls micronutrient deficiencies to some extent.



79. 5% Pongamia Solution

Required Materials:

Pongamia seeds – 5 Kgs

Detergent – 100 grams

Method of Preparation:

- Separate the seed from the hard coat and soak 5 Kg of seed for an hour in water
- Make a paste out of the soaked seeds
- Tie the paste in a cloth tie it and soak in a container of water for another 10 – 12 hr
- Extract the Pongamia solution by squeezing the solution for 15-20 minutes
- Add 100 g of soap powder to the extract
- Mix the mixture in 100 L of water and spray in an acre.

NOTE:

Depending on the stage of the crop and the intensity of damage, this can be sprayed 2-3 times per season. Soap powder can be substituted with Soap nut powder or Sheekai powder (500 g).

- This extract cannot be stored
- This is used in all kinds of crops

80. N.P.V Virus Solution

Pests controlled

Three types of N.P.V viruses exist

1. Against Helicoverpa – HNPV
2. Against Spodoptera – SNPV
3. Against Red Hairy caterpillar – RHNPV.

How it works:

Pests affected by NPV virus will die. The dead worms hang down from plants and shrivel. Collect these insects and grind them. This mixture will consist of NPV virus material. Spraying of this mixture on crops will spread the virus among the crop pests. In this way the virus will spread and kill the insects that harm the plants.

NOTE:

- This solution can be sprayed 1-2 times in crop a period, based on the intensity of pest incidence
- Select the proper Virus extract based on the type of infestation
- Dosage for HNPV is 250 LE, for Spodoptera it is 100 L.E and for Red Hairy caterpillar it is 200 L.E
- Store this mixture in cool place or in refrigerator.

81. Basil – Betel – Coral Jasmine Decoction

Vinnie Peora mentioned in 'Tending the Earth' that the decoction made out of these leaves were used to control diseases in rice.

82. Turmeric Extract

Make powder of 1 kg turmeric. Add 4 litres of cow urine to this. Mix the solution and filter with a thin cloth and add 100 g soap powder. Add 100 litres to this solution and spray in an acre during evening hours.



Pests Controlled:

Aphids, tobacco caterpillar, diamond back moth, paddy stem borer and pests of legumes and storage pests.

Diseases Controlled:

Grey rot in crops.

How it works

The various alkaloids in turmeric helps in pest and disease control

Note: 2-3 sprays yield good results

83. Dried Ginger – Milk Decoction

Used against all kinds of diseases

- Dried Ginger Powder: 200 grams
- Water: 2 Litres
- Cow or Buffalo Milk: 5 Litres
- Buttermilk can be substituted for milk

Mix dried ginger powder with 2 L water and boil till the contents become to a litre. Boil milk in another container. Cool both the contents and mix. This makes a decoction



Note:

- This decoction should be used on the same day and cannot be stored
- Mix the decoction in 200 L of water and spray per acre of crop

84. Herbal Pesticide Solution

This solution is developed by Sri.K.Nagarajan (Tamilnadu) for pest control in cotton.

Materials

- 500 g Neem seed
- 1 kg tobacco
- 100 g Vasa (Justicia gendarussa)
- 250 g Asafoetida
- 50 g soapnut powder

Grind the above and made into a solution. This is sprayed in 1 acre cotton field to control pests.

85. Buttermilk Solution to Control Leaf Spot Diseases

Gujarat farmers are using this method to control leaf spot in cotton. Fermented butter milk is mixed in water and sprayed. Good results can be obtained when sprayed in early stages of cotton.

86. Bait Solution to Control Adult White Flies

Gujarat farmers are using sugar bait solution to control adult pests in cotton. 500 g sugar mixed in 1 litre water and boiled. For a week Shade dry it. Add little oil to this. Pour this solution in broken coconut pieces and place in between rows of cotton. Adult pests get attracted and fall into solution and die. With this method adult pests of cotton can be controlled.



87. Prakruthika Jeevasaram

Use: This extract is usefull for increasing size of the vegetbales

Required material: 5 – 10 Coconuts, 5 litres Buttermilk,

Preparation: Take shredded coconut from 5-10 Coconuts and 5litres of butter milk, allow it ferment for 5 days. Filter the fermented solution and add 10litres of water

88. Pancha Bana Kashayam (pesticide)

Required material:

- Dung – 1 Kg
- Water – 10 litres
- Cattle urine – 1 litres
- Jaggery – 250 grs

Preparation: Mix all the ingredients thoroughly and allow it to ferment for 24hrs. After fermentation filter the solution and add 10ltrs of water.

89. Extract for Plan Nutrition:

Required material:

Dung – 1 Kg

Cattle urine – 1 litres

Water – 2 litres

Jaggery – 100 grams

Preparation:

Mix all the materials and keep the mixer in a pot and allow it for fermentation for 10 days. After fermentation add 1/20th Water to the mixer. Dug a trench around the plant and pour the extract in that trench and fill the trench with soil.

90. Jeeva Jeebrallic Acid

Take 1 Kg of Albizia amara and chaff the leaves into pieces add 5 litres of butter milk and allow it to ferment for 5 -6 days and filter it. Mix the solution with water (1:10 ratio). Spray it on the plants.

91. Pongam, Aloe and Neem Extract

Required Ingredients:

- Pounded Pongam cake – 1 Kg
- Pounded neem cake – 1 Kg
- Castor seeds – 250 grams

Preparation:

Put all the material in a muslin pouch and soak overnight in water. Next morning squeeze the pouch and take the extract. Add ½ lt of Aloe vera leaf juice. Add 15 litres of water to this solution. Add 2-3 litres of cattle urine. Dilute this solution with water in 1:10 ratio for spraying.



92. Custard Apple, Neem, Chilli Extract

Required ingredients:

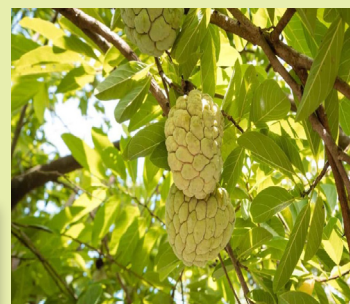
- Grounded Custard apple leaves – 2 Kg
- Dry chillie – 500 grams
- Crushed neem fruit – 1 Kg

Preparation:

Add 500ml of water to 2 Kg of ground custard apple leaves and stir. Filter the extract and kept aside. Take 500 grs of dry chilli and soak it in water overnight.

Next day ground the dry chillies and filter the solution to get extract. Soak one kilogram of crushed neem fruit in 2 litres of water overnight and the extract is filtered. All the three filtrates are subsequently mixed with 50 – 60 litres of water filtered again and spray over the crops.

For the above extracts, 250 ml of Khadi soap solution should be added as emulsifier before spraying.



93. Pongamia Leaf Extract

- Soak 1 kg of Pongamia leaves in 5 litres of water overnight
- Grind leaves next morning and filter
- Add 10 ml of emulsifier (Khadi soap solution)
- Effective against leaf eating caterpillars
- To spray an acre, 20 Kgs of leaves and 100 litres of water and 100 ml of emulsifier is required.



94. Garlic Extract

- Use 100 grs finely ground garlic
- Soak finely ground garlic in 2 – tablespoon liquid paraffin for 48 hrs
- Add 30 grams Khadi soap to ½ litres water and mix well
- Filter the solution and store in a plastic container
- To prepare 1 litre spray ad 15 ml of extract and mix well
- To spray an acre, 15litres of water is required.

F. BOTANICAL EXTRACTS FOR SOIL FERTILITY MANAGEMENT



F. BOTANICAL EXTRACTS FOR SOIL FERTILITY MANAGEMENT

95. Soil Microbial Enhancement – Bio Stimulant “Ghanajeevamrutham”

Required Materials

- Cow dung 100 kg
- Jaggery 1 kg
- Pulse Flour 1 kg
- Cow Urine 10 litres
- Handful of Uncontaminated Soil

Preparation

1. Mix all the ingredients well
2. Make cakes and shadow dry for fermentation
3. Apply these cakes in the field



96. Soil Microbial Enhancement – Liquid Biostimulant: Dravajeevamrutham

Required Materials

- Cow dung 100 kg
- Jaggery 2 kg
- Pulse Flour 2 kg
- Cow Urine 3-6 litres
- Water 200 litres
- Handful of Uncontaminated Soil

Preparation

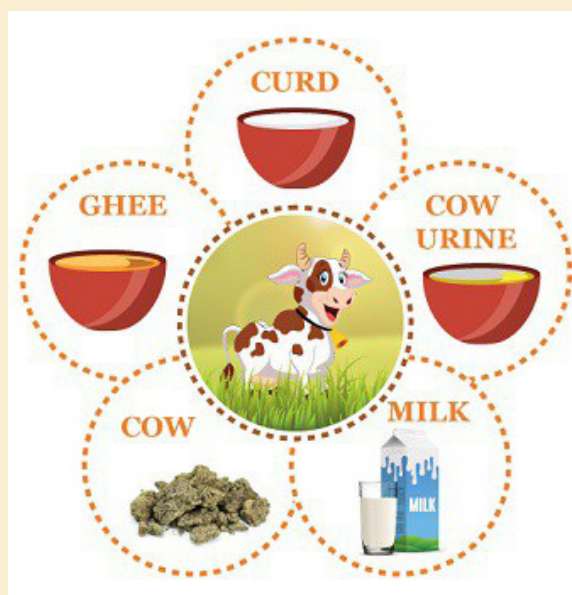
- Add all the ingredients and mix them in clock wise direction
- Keep it fermented for 5 days
- The colour and smell changes
- Keep mixing it in between
- Spray Dravajeevarutham in the field



97. Panchagavya

Materials Required

- CowDung 5 kg
- Cow Urine 3 litres
- Cow Curd ½ kg
- Cow Milk 2 litres
- Cow Ghee ½ kg
- Taddy 3 litres
- Black Jaggery 1 kg
- Well Ripened Bananas 12
- Tender Coconut Water 3 litres



Preparation

- Mix ghee and dung thoroughly and keep the mixture for four days in a pot.
- Add Cow urine, cow milk, cow cud, taddy, coconut water to the dung and ghee mixture on 5th Day.
- Then crush the ripened bananas and mix it with the solution.
- Cover the pot with a cloth and keep the solution for 15days. Then filter the solution with a thin cloth.

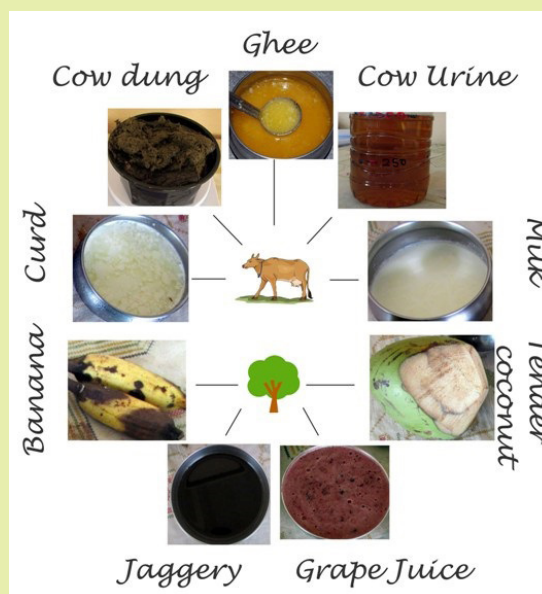
Application

- Panchagavya should be diluted before using on plants.
- In morning or evening hours, diluted solution can be sprayed directly on small plants.
- Mechanical sprays can also be used after filtration of diluted solution.
- For big trees, diluted solution is applied at the root zone with irrigation water.
- For pest or disease infested plants, entire affected area is sprayed.
- For controlling seed borne pathogens, seed treatment is given

98. Dasgavya

Ingredients

- Cow dung - 5 kg
- Cow urine - 3 litres
- Cow milk - 2 litres
- Curd – 2 Litres
- Cow Desi Ghee - 1 kg
- Sugarcane Juice - 3 litres
- Tender Coconut Water - 3 litres
- Banana Paste of 12 fruits
- Toddy or grape juice - 2 litres



Preparation

1. Mix cow dung and ghee in a container and ferment for 3 days with intermittent stirring. Add rest of the ingredients on the fourth day and ferment for 15 days with stirring twice daily
2. The formulation will be ready in 18 days. Sugarcane juice can be replaced with 500 g jaggery in 3 litres water. In case of non-availability of toddy or grape juice 100g yeast powder mixed with 100 g jaggery and 2 lit of warm water can also be used.
3. For Foliar spray 3-4 litres Dasgavya is diluted with 100 lit water. For soil application 20 lit Dasgavya is sufficient for one ac. It can also be used for seed treatment

99. “Amrutha Jalam”

Ingredients:

- Fresh cow dung: 1 kg
- Cattle Urine: 1 liter
- Organic Black Jaggery – 50 gms (can be substituted with 2 glasses of sugarcane juice or six over ripe bananas)
- Water – 10 liters



Process

- In a plastic or wooden bucket mix the jaggery with some water or urine to liquefy it.
- Mix in the cow dung and urine
- While doing the mixing stir slowly in one direction
- Add water, cover the container with a piece of cloth or any other loose cover and leave it to ferment.
- Make sure that the cover is not air tight. Avoid exposure to direct sunlight and rain.

**G. ON FARM PREPARATIONS
FOR GROWTH PROMOTION
AND PLANT PROTECTION**

अमृतपाणी

G. ON FARM PREPARATIONS FOR GROWTH PROMOTION AND PLANT PROTECTION

100. Sanjivak

For enriching the soil with microorganisms and quick residue decomposition

Method

- Mix 100 kg cow dung, 100 litres of cow urine and 500 gm jaggary in 300 litres of water in a 500 litre closed drum
- Ferment for 10 days
- Dilute with 20 times water and sprinkle in one acre or mix with irrigation water

101. Amirthapani

Promotes growth on Nitrogen and phosphate solubilizing bacteria in the soil.

Method

- Mix 10 kg cow dung with 500 gm honey.
- Add 250 gm of cow desi ghee and mix at high speed.
- Dilute with 200 lit water. Sprinkle this suspension in one acre over soil or with irrigation water.
- After 30 days apply second dose in between the row of plants or through irrigation water.



102. Concentrated Organic Manure

Helps to compensate additional nutrients during conversion period

Ingredients

- Rice bran 10 parts
- Fish meal 1 part (bone meal/slaughter house waste)
- Oil cake 1 part
- Egg shell 1% of total weight
- Rock phosphate 1-5%
- Molasses & Handful of Forest soil or EM
- Can add 10-12 diff. decomposing bacteria, fungi & actinomycetes – available



Process:

- Dilute molasses with water 1:500. Mix all the ingredients and add molasses water to the mixture to get 50-55%. Heap it and cover it with poly sheet.
- Turn over after 24 hrs. Thereafter turn it twice/ day
- Keep temperature at 40-45°C. Compost will be ready in 4-5 days.
- At the end of 5 days, check for smell. If foul smell is noticed, the compost has to be turned over 3 times a day further.

References

1. Mr. Subashpalekar
2. AP RySS
3. ICCOA
4. NITI AAYOG
5. Centre for Sustainable Agriculture

Photo References

- 1) <http://www.sudarshanasena.com/2017/01/gold-in-urine-of-gir-cows.html>
- 2) https://agritech.tnau.ac.in/org_farm/orgfarm_farming_practices_treatment_crop_cereals.html
- 6) <https://www.pfw.edu/microsites/native-trees/eastern-redcedar>
- 8) http://www.agritech.tnau.ac.in/expert_system/paddy/cpdisblast.html
- 11) <https://efloraofindia.com/2011/04/05/vitex-negundo/>
- 12) <https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.youtube.com%2Fwatch%3Fv%3D-vQWtq57Ey1l&psig=AOvVaw2MkLPk6FebfdN3p6-TdoD&ust=1653108535308000&source=images&cd=vfe&ved=0CAwQjRxqFwoTCNDv68al7fcCFQAAAAAdAAAAABAD>
- 13) <https://camelclimatechange.org/camel/activities/109936.html>
- 14) http://www.agritech.tnau.ac.in/expert_system/paddy/cpests_WBPH.html
- 15) https://agritech.tnau.ac.in/org_farm/orgfarm_green_manure_neem.html
- 19) https://www.123rf.com/photo_47038076_herbal-medicine-the-decoction-of-nettles-in-a-glass-mug-and-fresh-leaves-in-a-basket-on-a-light-yell.html
- 23) <https://ucanr.edu/blogs/blogcore/postdetail.cfm?postnum=18009>
- 24) <https://www.nccih.nih.gov/health/ginger>
- 25) <https://www.britannica.com/plant/custard-apple>
- 27) <https://www.google.com/url?sa=i&url=https%3A%2F%2Fsgp.undp.org%2Fall-documents%2Fcountry-documents%2F1027-how-to-make-pesticide-from-neem-tree-seeds%2Ffile.html&psig=AOvVaw3kRffxb-1Ks-gvoZQvVwLA3&ust=1654612918532000&source=images&cd=vfe&ved=0CAwQjRxqFwoTCMCGnN-WHmfgCFQAAAAAdAAAAABAD>
- 28) <https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.shutterstock.com%2Fsearch%2F-garlic%2Boil%2Bextract&psig=AOvVaw35--5eDdBGEAOmW9ciC3ZS&ust=1654613823131000&source=images&cd=vfe&ved=0CAwQjRxqFwoTCPCbxqmLmfgCFQAAAAAdAAAAABAJ>
- 29) <https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.thebetterindia.com%2F207179%2F-how-to-protect-indoor-plants-pest-attack-organic-pesticides-diy-india%2F&psig=AOvVaw3977Alvz7Dm-cPSdHtXjepT&ust=1654614050151000&source=images&cd=vfe&ved=0CA0QjhxqFwoTCMCX4-eLmfg-CFQAAAAAdAAAAABAO>
- 34) <https://www.google.com/url?sa=i&url=https%3A%2F%2Fen.wikipedia.org%2Fwiki%2FBasil&psig=AOvVaw0pzNoibl-uctys63TY4lmt&ust=1654614429374000&source=images&cd=vfe&ved=0CAwQjRxqFwoTCMjciqiNmfgCFQAAAAAdAAAAABAD>
- 36) https://www.google.com/url?sa=i&url=https%3A%2F%2Ftimesofagriculture.com%2Fhow-to-make-ag-niasthra-organic-pesticide%2F&psig=AOvVaw1puSdxV17rUpFw3a2_7j06&ust=1654615208592000&source=images&cd=vfe&ved=0CAwQjRxqFwoTCIC5kpWQmfgCFQAAAAAdAAAAABAE

- 37) <https://www.google.com/url?sa=i&url=https%3A%2F%2Fmarathi.krishijagran.com%2Fagripedia%2Flearn-the-benefits-of-deciduous-extract-thus-prepare%2F&psig=AOvVaw2a8yGQK2Y4nwikBFW11n-lj&ust=1654615302521000&source=images&cd=vfe&ved=0CAwQjRxqFwoTCKDDlCQmfgCFQA-AAAAAdAAAAABAJ>
- 41) https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.pinterest.com%2Famp%2Fpin%2F404057397801797443%2F&psig=AOvVaw3-jpWyXvmjpf9f4wxGIMu_&ust=1654615994117000&source=images&cd=vfe&ved=0CAwQjRxqFwoTCOjjnpKTmfgCFQAAAAAdAAAAABAD
- 43) <https://www.google.com/url?sa=i&url=https%3A%2F%2Fbalconygardenweb.com%2Fwonderful-peppermint-oil-uses-in-the-garden%2F&psig=AOvVaw1rn9tvmfR24JcT38eGJ4iq&ust=1654616164373000&source=images&cd=vfe&ved=0CAwQjRxqFwoTCMD-89qTmfgCFQAAAAAdAAAAABAO>
- 44) https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.pinterest.com%2Fpin%2F428053139580271061%2F&psig=AOvVaw1_3VkRxTUIthrK-HFEiygC&ust=1654616307839000&source=images&cd=vfe&ved=0CAwQjRxqFwoTCICj_p-UmfgCFQAAAAAdAAAAABAD
- 48) <https://www.google.com/url?sa=i&url=https%3A%2F%2Fagriculture90.blogspot.com%2F2015%2F10%2Fpest-control-corp-using-natural-pesticides.html&psig=AOvVaw10KnLGAQV5YrPrkJUdfOAa&ust=1654616391723000&source=images&cd=vfe&ved=0CA0QjhqxqFwoTCNjhlC-UmfgCFQAAAAAdAAAAABAI>
- 50) https://www.google.com/url?sa=i&url=https%3A%2F%2Fen.wikipedia.org%2Fwiki%2FBordeaux_mixture&psig=AOvVaw1nOhAZs4PydHc0Ausf80yS&ust=1654616573982000&source=images&cd=vfe&ved=0CAwQjRxqFwoTCNCuo5-VmfgCFQAAAAAdAAAAABAD
- 51) https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.researchgate.net%2Ffigure%2FFigure-1-Aegle-marmelos-L-Corr_fig1_301548347&psig=AOvVaw2ib5ldqyal-g_CXibvqo-&ust=1654616681384000&source=images&cd=vfe&ved=0CAwQjRxqFwoTCMCSINaVmfgCFQA-AAAAAdAAAAABAD
- 57) <https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.floweraura.com%2Fblog%2Feverything-you-need-to-know-about-parijat-flowers&psig=AOvVaw2spfRiJuwHBmKRM8HpdHg-c&ust=1654616997613000&source=images&cd=vfe&ved=0CAwQjRxqFwoTCIDtn-iWmfgCFQA-AAAAAdAAAAABAD>
- 58) <https://www.google.com/url?sa=i&url=http%3A%2F%2Fmedplants.blogspot.com%2F2013%2F03%2Fthespesia-populnea-poovarasu-gangaraavi.html&psig=AOvVaw1eZpYGTduEMCM4m0fc24M-J&ust=1654617076024000&source=images&cd=vfe&ved=0CAwQjRxqFwoTCPjmpYyXmfgCFQA-AAAAAdAAAAABAD>
- 63) https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.researchgate.net%2Ffigure%2FLantana-camarala-leaves_fig2_283314585&psig=AOvVaw2LpYAaj3EekagaZOChCeUA&ust=1654617285785000&source=images&cd=vfe&ved=0CAwQjRxqFwoTCMJpPgPCXmfgCFQAAAAAdAAAAABAD
- 66) https://www.google.com/url?sa=i&url=http%3A%2F%2Fwww.kvsmt.com%2Fservice%2Fneem-as-tra%2F&psig=AOvVaw1x_WM-3AXphX9Y0kIT3Kq3&ust=1654617384027000&source=images&cd=vfe&ved=0CAwQjRxqFwoTCOj5mZ6YmfgCFQAAAAAdAAAAABAD
- 73) https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.researchgate.net%2Ffigure%2FThe-plant-Jatropha-curcas-in-the-local-language-also-termed-lapalapa-funfun-is-used_fig1_51490868&psig=AOvVaw1WHefAcb5VWumjx3RQJ9to&ust=1654617582855000&source=images&cd=vfe&ved=0CAwQjRxqFwoTCJiy4vuYmfgCFQAAAAAdAAAAABAD
- 77) https://www.google.com/url?sa=i&url=https%3A%2F%2Fleisaindia.org%2Ffish-amino-a-useful-biological-option%2F&psig=AOvVaw3I75_jUVn7Nifaq408I2yc&ust=1654617638232000&source=images&cd=vfe&ved=0CAwQjRxqFwoTCIiX95iZmfgCFQAAAAAdAAAAABAD
- 78) <https://www.google.com/url?sa=i&url=http%3A%2F%2Fwww.ecosecretz.com%2F2017%2F10%2Fbio-digestor-fertigation-vermiwash.html&psig=AOvVaw30sg2N-Off4fxTGIQa1d-vH&ust=1654617708318000&source=images&cd=vfe&ved=0CAwQjRxqFwoTCLDLwNaZmfgCFQA-AAAAAdAAAAABAK>

- 82) <https://backgarden.org/turmeric-for-plants/>
- 83) <https://krishijagran.com/agripedia/processing-of-ginger-now-make-your-own-dry-ginger-at-home/>
- 86) https://en.wikipedia.org/wiki/Silverleaf_whitefly
- 91) <https://www.dreamstime.com/stock-image-herbal-neem-leaves-aloevera-medicinal-over-white-back-ground-image34595511>
- 92) 1. <https://www.agrifarming.in/top-16-steps-to-boost-custard-apple-yield-how-to-increase-fruit-size-quality-and-production>
- 92) 2. <https://krishijagran.com/agripedia/eco-friendly-pesticides-know-about-the-benefits-of-neem-oil-manure/>
- 92) 3. https://www.agrigoaexpert.res.in/icar/category/horiculture/vegetable_science/chilli.php
- 93) <https://vikaspedia.in/agriculture/agri-inputs/bio-inputs/production-of-ipm-inputs/botanicals>
- 95) <https://in.pinterest.com/pin/660621839077425181/>
- 96) <https://www.veragrofarm.com/subhash-palekars-natural-farming-methods/>
- 97) <https://www.cowkart.com/panchgavya-the-universal-benefits-of-cows-endowments/>
- 98) <http://organicterrace.in/blog/how-to-prepare-panchagavya-recipe/>
- 99) <https://www.youtube.com/watch?v=DcGxAoD5dlw>
- 101) <https://www.youtube.com/watch?v=3roZOWE7mJo>
- 102) https://agritech.tnau.ac.in/ta/org_farm/orgfarm_manure.html

Prepared by

Mr Jayaram Killi

National Mission Management Unit

National Rural Livelihoods Mission

Ministry of Rural Development

Government of India

