

## ORGANIC FARMING FOR SUSTAINABLE AGRICULTURE

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### INTRODUCTION

*“The ploughers are the linch pin of the world; they bear them up who other works perform, too weak its toils to share”*

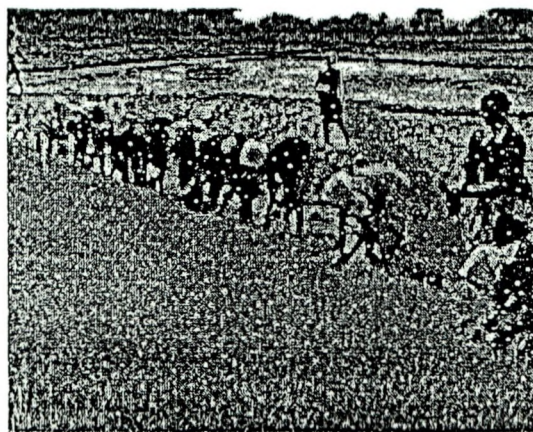
- *Thirukural*

*“Agriculture is the greatest living Industry”*

- *Jawaharlal Nehru*

Agriculture is the bed rock for Man's survival. It is the foundation of man's food and his well being. As Gandhiji said, if India is to be strong, our villages must be healthy and prosperous.

The importance of agriculture has many dimensions. More than 70 percent of the population is directly or indirectly dependent on agricultural activities. This is one reason that agriculture is central to all strategies and planning for the socio-economic development of the country. It is not only a major segment of our economy contributing 27 percent of GDP, but also the provider of gainful employment (64 percent of the workforce) and income to maximum number of people. It also contributes 2 percent of total exports and provides raw materials to several industries. Further agriculture is at the core of many elements of our social and cultural heritage (Subba.et.al,(2012).



Green revolution in India has succeeded in increasing yield of major crops and income of farmers though introduction of high-yielding varieties, use of synthetic fertilizers and pesticides, are made India self reliant in food production. However, the conditions of stagnant agriculture production, limited expansion of cultivable lands, increased population and industrialization in the post green revolution period has pushed agriculture towards indiscriminate use of pesticides exploitation of ground water for irrigation and imbalanced fertilization to achieve higher production.( Dhaka et.al, (2012). This resulted in chemical agriculture and agriculture sustainability became threatened due to depletion of land area for agriculture, decline soil fertility, increased soil scrutiny environmental deterioration, health hazard and degradation of bio diversity. Moreover the declining use efficiency of inputs and gap in output-input ratio cause the crop production less remunerative, rather agriculture has become subsistence-farming activity in most parts of the country.( Niels Halberg et.al, (2012). The over-doses of fertilizer, and pesticides resulted in intolerable pollution in water, soil and air. Frequent application of fertilizers and pesticides, irrigation with heavy water, soil treatments with chemicals are responsible for soil degradation resulting in 179 lakh hectares of land of foetal 329 lakh hectares as unsustainable for crop cultivation.( Mandal, J.P. (2009)) With increased use of pesticides the food produce contains pesticides residues, which are injurious to health. The pesticides get into soil and water and the environment gets affected increasing consciousness about health hazards associated with agro chemicals and consumers' preference to safe and hazard free food are the major factors that lead to the growing interest in alternative forms of agriculture in the world. The demand for organic food is steadily increasing both in the developed and developing countries. (Earl(2010). Organic refers to an "earth friendly" or an eco-friendly and health-supportive method of farming and processing foods. Weeds and pests are controlled using environmentally sound practices that sustain our personal health and the health of our planet. The term "organic" applies to both animal and plant foods. (Eric Lichtfouse(2009). To the maximum extent possible, organic farming concentrates on crop rotations, residues, manures, legumes, green leaf manures, green manuring off-farming organic wastes and biological methods of pest control to maintain soil productivity and tilth to supply plant nutrients and to control insects, weeds and other pests.( Kumar and Singh (2009))These are the some organic farming practices for pre and post harvest period.

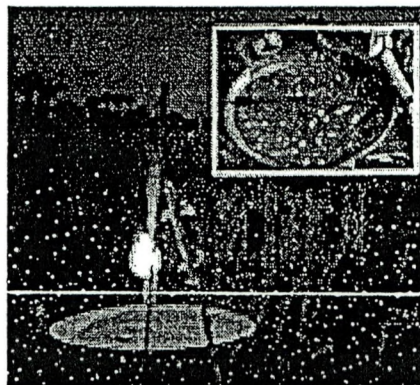
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## ORGANIC FARMING PRACTICES:

### PRE HARVEST PERIOD

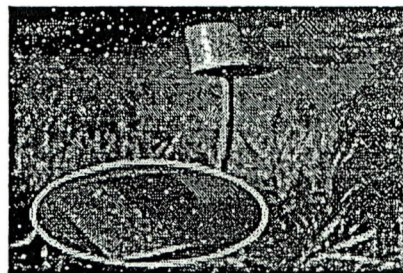
#### 1. Light trap

Light traps can be used to monitor and trap the adults thereby reducing the population. Some common light traps that could be used are bonfire, hurricane lamp, trap with electrical bulb etc. The adult moths have an inherent capacity to get attracted to the light. It should be set up in the field after 5.30p.m. A large plate or vessel filled with kerosene mixed water is kept near the light trap. The attracted moths fall in this water and die



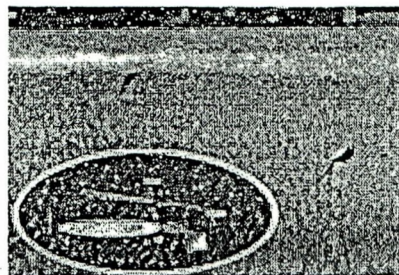
#### 2. Yellow sticky trap

Grease or castor oil smeared yellow colour empty tins or plates are kept in the field. White flies get trapped on these sticky traps. These are wiped out every day and grease is applied again.



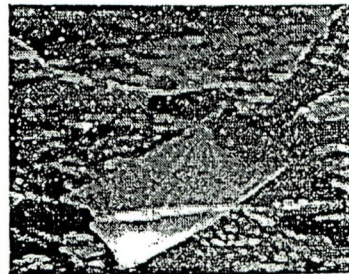
#### 3. Bird perches

Install "T" shaped bird perches which are long dried twigs @ 15-20 per acre. These attract birds for resting and the resting birds devour the larvae in the field.



#### 4. Hand picking method

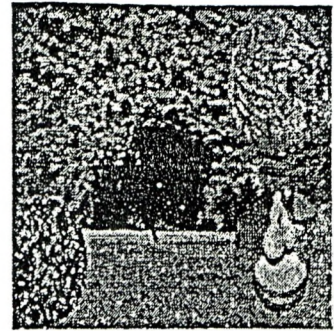
This method of pest control is useful if the crop is in a small area. Pour a small amount of kerosene in a polythene bag and pick up the larvae during evening hours and put it in the bag. The pests can be controlled this way without the use of any chemicals. This should be done when the pest numbers are low.



#### 5. Neem kernel extract

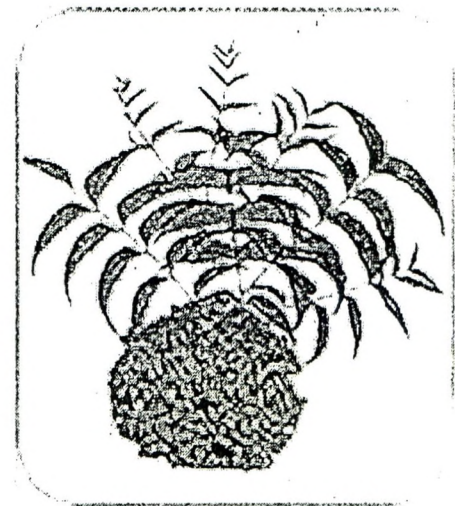
3 - 5kgs of Neem kernel is required for an acre. Remove the outer seed coat and use only the kernel. If the seeds are fresh, 3kgs of kernel is sufficient. If the seeds are old, 5kgs are required. Pound the kernel gently and tie it loosely with a cotton cloth. Soak this overnight

in a vessel containing 10 litres of water. After this it is filtered. On filtering 6 - 7 litres of extract can be obtained. 500 - 1000ml of extract is used for one tank (a tank of 10 litre capacity). 500 - 1000ml of extract should be diluted with 9½ or 9 litres of water before spraying. Khadi soap solution @ 10ml/litre (100ml/tank) should can be increased or decreased depending on the intensity of the pest attack.



#### 6. Neem leaf extract for protection

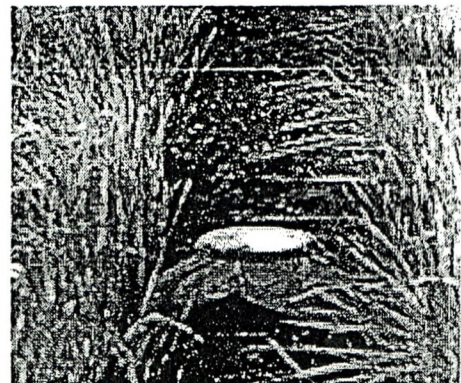
10 - 12 kgs of Neem leaves are required for use in an acre of land. Pound the leaves gently and tie it loosely with a cotton cloth. Soak this overnight in a vessel; containing 20 - 24 litres of water. After this, it is filtered. On filtering, 15 - 17 litres of extract can be obtained. About 500 - 1000ml of extract should be diluted with 9½ or 9 litres of water before spraying. Khadi soap solution @ 10ml/litre (100ml/tank) should be added to help the extract stick well to the leaf surface. The concentration of the extract can be increased or decreased depending on the intensity of the pest attack. The shelf life of this extract is one month.



Khadi soap solution should be added with all neem extracts before spraying. This is a neem based soap without any detergent. It should be soaked overnight in water and used. The soap solution should be sticky and thick in nature.

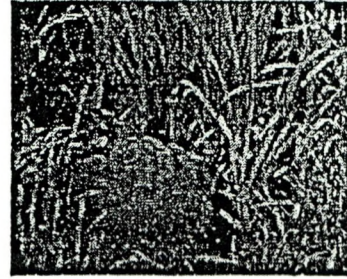
#### 7. Neem as pest repellent

Neem leaves or neem cake or neem kernel. Pound it well and place it in a pot. Add twice the volume of water and tie the mouth of the pot with a cloth. Leave it as such for 3 days. Then, place the pots on all the 4 corners of a field. In the evening, open the mouth of the pots. The soul smell emanating from the neem products prevents entry of pests into the field.



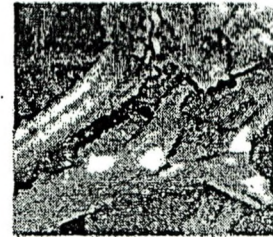
8. Neem cake for pest control and manuring

Place gunny bags filled with neem cake along water canals. Neem cake dissolves in the water flowing along the canals and this water irrigates the field. The practice prevents attack of pest and diseases affecting the roots and tillers of the crop. This bag should be replaced once in 15 days.



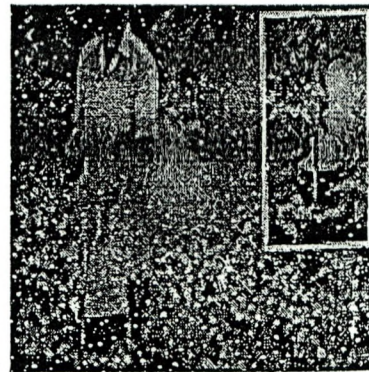
9. Neem to control stem borers on young plants

A small amount of crushed neem seed powder should be mixed with the same amount of dry clay or sawdust. The mixture is placed in the funnel of young maize or sorghum plants. Rain will gradually dissolve the active chemicals in the neem seed. This treatment may need to be repeated every 8 to 10 days until the plants flower.



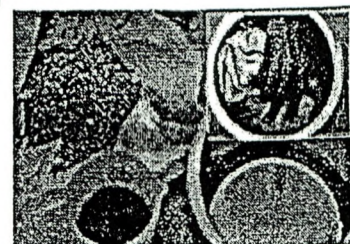
10. Fumigation combined with other organic methods for disease control

10% cow's urine extract should be sprayed for crops affected by disease. On the same day or the next day, fumigation should be done in the evening. Vaidanaga (*Embelia ribes*) is powdered well (200gms per acre). It is then put in a wide mouthed pot with burning charcoal and carried in the field in a direction opposite to the wind. On the 7<sup>th</sup> day after fumigation, 300ml of sweetflag (*Acorus calamus*) extract along with one litre of cow's urine is mixed with 8.7litres of water (measurement for one tank) and sprayed on the crops. Sweet flag extract is prepared by soaking 500gms of sweet flag powder in 2 litres of water and then filtering the same. This method prevents wilting in chilli.



11. Seed treatment with cow's urine

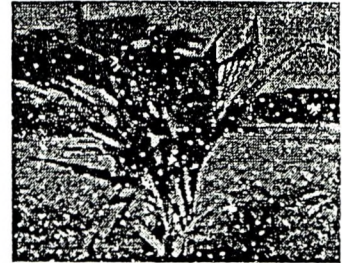
500ml of cow's urine is diluted with one litre of water. The seeds that are to be sown should be soaked in this half an hour. After this, the seeds are shade dried before sowing. Paddy seeds are normally soaked in water for a day or two



before sowing. Hence, the paddy seeds should be first treated with cow's urine and then soaked in water.

12. Aloe with coconut sapling

Aloe saplings are planted near the coconut saplings. By this method, termites and nematodes which attack the roots of the coconut saplings are kept under check. Similarly, castor is planted as a border crop in cotton fields. This traps the bollworms which are serious pests of cotton. Green gram can also be intercropped with cotton. The green gram crop harbours the predatory ladybird beetles.



13. *Andrographis paniculata* (known as Sriyanangai in Tamil) decoction 3-5% or *Sida spinosa* decoction 5%

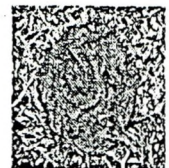
For preparation of these decoctions, one of the above mentioned plant is taken (the whole plant excluding roots) and cut into small pieces. One kg of this is mixed with four litres of water and placed in a mud pot. This is boiled and reduced to one litre. On cooling, 500ml of this extract is mixed with 100ml of soap solution and 9.4 litres of water and sprayed on the crop (measurement for one tank).

14. Garlic, Chilli, Ginger extract 500 - 1000ml per tank (10 litre capacity)

This is a mixture of three plant extracts. 18gms of Garlic is taken, the outer skin is removed and made into a paste. A paste of 9 gms of green chillies and 9 gms of ginger is made. All the three pastes are dissolved in 1 litre of water. This mixture is stirred well and filtered before spraying. 500ml of this extract is mixed with 100ml of soap solution and 9.4 litres of water and sprayed on the crop (measurement for one lakh). (Mandal, J.P. (2009))

15. Cow dung extract

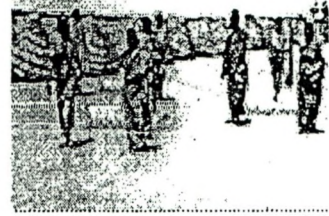
1kg of dung and mix it with 10litres of water. Filter the extract with a gunny cloth. Add 5 litres of water to the filtrate and again filter it with the same cloth. The filtrate will be a very clear solution. Spray the filtrate on the plants.



## POST HARVEST PERIOD

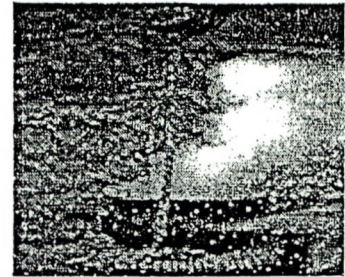
### 1. Preparation of grains for storage

The food grains should be properly cleaned, dried, graded and cooled before storage. The moisture content of the stored food grains should be brought down below the safe level, which is 14 per cent for paddy and 12 per cent for other food grains.



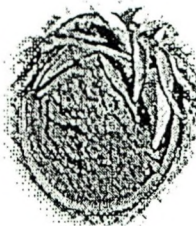
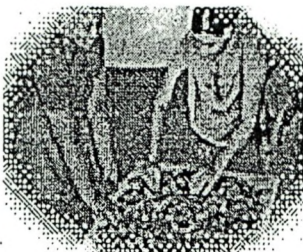
### 2. Preparation of storage rooms and structure

- The storage rooms should be properly cleaned and the trash and garbage removed.
- The walls and ceiling should be white washed and surface inside and outside should be sprayed with neem leaf extract or neem kernel in the proportion of 1:100 (1 litre extracts mix with 100 litre of water) once in 15 days.
- Disinfect the storage rooms with neem leaves smoke before storing food grains to avoid insect attack.
- Use of mint leaves smoke in grain storage reduce hatchability and protects insect infestation.
- Use of tar coal sheet in between storage structure to avoid insects attack.
- Keeping aloe vera near the storage room to avoid insect infestation.



To prepare a neem packet for storage

- i. Clean the neem leaves and dry under shade.
- ii. After drying make it into fine powder.
- iii. Pack the prepared neem powder with clean white muslin cloth.



References :

- A. Vaidyanathan,(2011)Agricultural Growth in India Role of Technology Incentives and Institutions,Pp.51.
- Eric Lichtfouse,(2009), Organic Farming, Pest Control and Remediation of Soil Pollutants (Sustainable Agriculture Reviews), Pp.5-6.
- Earl D. Straub , (2010),Organic Food: Economics and Issues , Pp. 101-136.
- Kumar and Singh (2009) Role of women in agriculture, Agricultural Extension Review, September-October, Vol. 14, No. 5, Pp. 9-12.
- Mandal, J.P. (2009) Organic methods of safe and simple storage, Vol. 10, Pp.57-90.
- Niels Halberg, Adrian Mueller, (2012) Organic Agriculture for Sustainable Livelihoods, Pp.75-77.
- S. R. Dhaka,B. L. Dhaka,R. A. Jat, and S. R. Kantwa(2012) Agricultural terminology, Pp.14-19.
- Subba Reddy,S. , Raghu Ram, P. , Neelakanta Sastry T.V, and I. Bhavani Devi(2012)Agricultural Economics, Pp.34-39.