Our Ancient Methods of Pest Control

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Sri Lankan agriculture, which is over two thousand years old was the main livelihood of the people as well as the main source of income for the country. Although the appropriate crops were selected according to their wish by farmers who engaged in the cultivation of a variety of crops, they had to struggle hard to control the diseases which afflicted these crops and to protect them from pestilences.

Although artificial agrochemicals are used by farmers today for pest control, in the olden days, rituals and other traditional methods which successfully controlled pestilences without causing damage to the environment were used resulting in a wholesome and bountiful harvest.

The time is now opportune to examine whether the methods used for pest control in the past were more effective than those used at present. It is quite evident that physical elements such as light, heat and sound were used in the past, for pest control.

Torches prepared by wrapping rags dipped in **"Mee" (Madhuca) "Kohomba" (Margosa)** or **coconut** oil at the end of a stick were planted on the embankment on either side of the water course or stream which carries water through the field, positioned to stand across the water and were lit. In the night, the farmers gather together and walk up and down in every section of the paddy field clapping hands or making some such noise. Insect pests disturbed by this noise rise up into the air and are attracted by the light from the torches and eventually are burnt to death by the heat from the flames.

This method known as a **"light trap"** is used by many rural farmers even today. The torches lit for this purpose do not cause any damage to the environment and the pests are also controlled successfully.

Maturing

As the paddy seeds mature they acquire a milky taste. They are very much prone to damage by rats. The farmer struggles hard to save the paddy from rats that attack the entire plant. To prevent the damage caused to the paddy in this way, the farmer chops up the raw fruit of papaw (***Carica papaya***) into pieces and scatters the pieces all over the paddy field. Rats who come to attack the paddy bite into these pieces of raw papaw and the sap or latex on the pieces of raw papaw injure their gums and their mouths become sore. The rats find it difficult to munch the paddy with their sore mouths and go away. By the time the rats return with their mouths healed, the paddy is already harvested. In this way the farmers at that time were able to get a full harvest without mortally harming the rats and with minimum damage to the environment.

The Winnow Method or `Kulugaema'

"Kulugaema" is a method used to control insects which fly around during day time. The mucilage **(koholle)** from jak fruit is applied on the back of the winnowing basket which is used to winnow rice and it is slowly dragged across maturing paddy. The air is disturbed by the movement of the winnow causing the insects resting on the paddy to come out. While flying out they get stuck on to the mucilage at the back of the winnowing basket.

The farmers carry out this operation about twice a day, when the mature paddy is close to sprout into ears.

The farmers also place sporadically in the paddy field the stalks of coconut branches, with their wider end turned up, to encourage the birds that fly about in the field to rest on them. Birds resting on these upturned coconut stems spot and prey on the flying insects. This too is a very simple method used by the farmer to control insects.

`Water Ghost' (diya holmana)

A piece of bamboo about 02 segments long is placed at the spot where water flows down from one bed of rice to the one below, and a stone is placed underneath. At the sight of the bamboo stick which rises and falls as the water flows, animals which come to water in the stream are frightened and they keep away. By this method which is known as **"Diya holmana"** the farmer was able to protect the paddy from beasts.

An arrangement made by fixing on a palmyrah branch a nail which would strike against a bottle or a tin when the wind blows, was a commonly used method of chasing away the birds which come to feed on the crop. This was called the"wind ghost" **(hoolang holmana)** by farmers. The intention of the farmer in using such methods was to improve the harvest while at the same time, protecting the environment.

Biological Control

Controlling the growth of a plant or animal species, or destroying a species by using another living species, is known as biological control. This is a successful method which is less harmful to the environment than the destruction of pests by the use of chemical pesticides. This involves the seeking of the natural enemies of pests and using them to destroy the pest concerned. These enemies could either be a mutant, a parasite or a pathogen of the pest. The pest is controlled when it becomes the victim of the parasite at a certain phase of its life cycle. The parasite causes diseases to the pest. When the disease aggravates, the pest dies. In this way, the pest is destroyed. Microorganisms such as fungi, bacteria and viruses are often used as pathogens for pest control.

Small fish such as ***Barbus uneya*** (thiththaya) and ***Aptocheitus dayi*** (irinala handaya) as well as the frog and the monitor, can be named as most suitable mutants for pest control.

The white fungus called ***Nomureae releyi*** is used to control insects such as the rice caterpillar, (***Spodeptera mauritia***) and the pink stem borer ***(Sesamia infereus)*** while the fungus known as ***Mettarhihzinm anisopliae*** is used to destroy rice Pentatoid bug (***Seotinophera lurida***). The micro organism with the scientific name ***Euboralia stalli*** feeds on rice caterpillars which attack the paddy.

The "mee" Tree (*Madhuca longifolia*)

The ancient farmers grew the madhuca or `mee'tree on the borders of paddy field and in bare areas in the middle of the fields. When the madhuca trees are in bloom, the fragrance from the flowers waft in the air. The bees and birds which are attracted by the sweet smell of the flowers, help in the control of insect pests. The migration of bees and birds also cause pollination improve the yield.

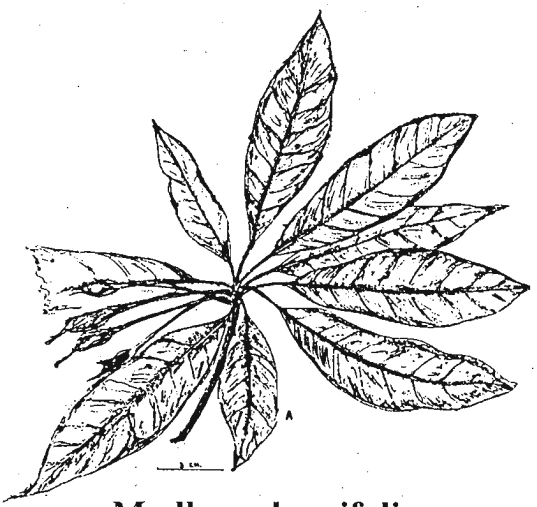
A ritual performed by farmers using "light traps" for the protection of the crop is the lighting of torches prepared by dipping old robes of Buddhist monks in madhuca oil or resinous oil for ola leaf and planting them at random in the paddy filed.

Also the poonac left over from the preparation of madhuca oil was mixed with frankinscence and mucilage from the ***Canarium zylanicum*** (kekuna) and burnt as incense at the four corners of the field and lamps were lit with madhuca oil to chase away the insect pests.

The farmers buried the roots of the *Madhuca longifolia* randomly in the field and also across the water in the water course which runs across the field. The madhuca roots rot and the essences are mixed with the water. These essences mixed with the water destroy the insect larvae and pupae. Through his familiarity with nature the farmers had the knowledge that the essence of the madhuca root was a substance which would help to destroy insect pests but was on the other hand not harmful to the environment. However what modern scientific research has revealed is that the root of the madhuca tree contains a chemical known as saponin which has pesticidal properties.

Insects such as ***Orceolin oryzue*** (gop messa) and ***Atherigona eseigna*** (kandan messa) caused as much damage to paddy in ancient times as they do today. The farmers in those times, did not employ artificial pesticides to control such pests but instead used plants in the environment to achieve this purpose.

Juice obtained by chopping up and crushing plants such as ***Derris scandes*** (Kalawel) ***Lypersion esculentium*** (thiththa wel) ***Eupholsia antignomum*** (daluk) and leaves of the pineapple plant were sprinkled all over the field and also mixed with the water to control insect pests such as `kandan messa' and `gop messa'.



Madhuca longifolia

The "mee" tree

The paddy crop at the early stages is prone to damage by worms. To protect it from such damage farmers bury leaves of ***Cinnamomum zeylanicum*** (cinnamon)in the soil when preparing the soil for the crop. Farmers often mixed the dried shredded leaf of the ***Croton lexifenio*** (Keppetiya) into the soil.

In ancient times the farmers were aware that pests find certain smells repulsive. Therefore they grew trees such as the ***Cycas citratus*** (madu) in vacant spaces of the paddy field and pests approaching the field were repelled by their smell. The intention of the farmers was to keep the pests away and also to control them to some extent.

Sprinkling of ash

Even today farmers in many areas, hang a cloth bundle of ash on a long stick and beat it with another stick. The ash that come out of the bundle is carried by the wind and scattered over the paddy. The wood ash sprinkled in this way helps to control many insect pests.

The Margosa (Kohomba) tree

The margosa tree which grows well in the dry zone was used by farmers as a pesticide. The extract of the kohomba seeds was a valuable pesticide to ancient farmers. The extract of margosa was used to destroy the brinjal pod borer and ancient farmers used this substance as a pesticide to protect a variety of crops. Furthermore, the margosa tree was grown in home plots and paddy field as the farmers know the medicinal value of the tree as well as its purifying effect on the atmosphere.

Replanting time

Changes made to the period between the replanting and harvesting also have a strong impact on pest control. For instance, if an insect pest is in the habit of laying its eggs on the surface or underside of a leaf it is possible to bring about natural control of the pest by avoiding the time that they lay eggs, when planting. The pest is controlled by the proper time opportunity and place for laying its eggs.

Why are we attracted to artificial agrochemicals which destroy the ecosystem when we have our traditional agricultural methods which have protected our crops and our environment for thousands of years? The use of artificial pesticides will destroy not only the pests that damage the crops, but also organisms which are beneficial to the environment.

Rotation of crops also helps in the control of pests. The pests which are used to a particular crop are destroyed naturally when different crop is planted. This was a method often adopted successfully by ancient farmers for pest control.

Pest Control through water management is also an ancient traditional method adapted in Sri Lanka. Water is allowed to remain in the beds prepared for paddy for 4-5 days. Paddy pests as well as other harmful organisms in the water die due to the stagnation of water. When the water is let out by opening a gap in the ridge, the dead paddy pests as well as other organisms are removed along with the water. This practice is recognized as a successful method by the present day farmers as well as his counter parts in ancient times.

Why are we attracted to artificial agrochemicals which destroy the ecosystem when we have our traditional agricultural methods which have protected our crops and our environment for thousands of years? The use of artificial pesticides will destroy not only the pests that damage the crops, but also organisms which are beneficial to the environment. As the final outcome of this, the fertile soil will turn out to be sterile and the ecological balance will be disrupted and the environment polluted when the soil gets accustomed to the agrochemicals and the useful organisms in the soil are eliminated.