The Potential Of Locally Produced Plant Pesticides

6. Butimba

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Introduction:
Small-scale farmers in Northern Tanzania grow vegetables that include tomatoes, cabbages and onions and use many types of pesticides to control pests and diseases that attack these crops. Studies show that the use of DDT as a pesticide has been responsible for the decline in the population of pelicans, ospreys and eagles birds that feed at the top of food chains. The accumulation of DDT in the tissues of these birds interfered with the deposition of calcium in their eggshells. When these birds tried to incubate their eggs, their weight broke the shells of the eggs hence a decline in a species level (Delong M et al, 1976).
One study by WHO in October 2007 has linked breast cancer from exposure to DDT prior to puberty. Poisoning may also occur due to use of DDT and other chlorinated hydrocarbons by entering the human food chain when animal tissues are affected. Symptoms include nervous excitement, tremors, convulsions or death (Wikipedia as retrieved on 25th August 2012).
In Tanzania for example most women peasants have been affected by these pesticides to the extent of developing breast cancer. It is reported that the shape of the industrial pesticides resemble that of the female hormones estrogen, as a result they trigger too much cell proliferation hence cancer. As one is more exposed to the industrial pesticides the more the cancerous cells sets in and they tend to exceed the leucocytes cells responsible for fighting against body's invaders.
This project is therefore an attempt to correct the side effects that have occurred as a result of use of industrial pesticides to curb plant pests. The hypothesis here is that "local plant pesticides are effective in killing pests and yet they are environmentally friendly.

Method:
The project introduces to you; two plants that have been studies and produced positive results as the local plant pesticides on the Brassica rapa (commonly Chinese). The plants are shown in pictures below.

Seeds of Mboyo Plant (Local name) the seeds are used for making the pesticides when ripe as they appear on the picture above.

Materials and Methods used:
The project used the following materials Hand hoe for tilling the land, buckets for watering the vegetables under experiment, poultry manure applied in the plots of land where the vegetables were grown and a digital camera for taking in pictures from the field and other related events to the experiment. Other materials used include a 1000 cm^3 beaker for measurement of water that was used to make the pests suspensions to be applied to the plants under study (Brassica rapa) or commonly called Chinese. In the project we also used an electronic balance, watch glass and beakers that were used in the measurement of the pesticides and the vegetable harvests at the end.
The motor and pestle were also used in grinding the leaves of Tephrosia vogelii (Utupa) and the seeds of Mboyo to obtain the pesticides. We also a glass rod to stir the contents of the solid pesticides made and the water added to make a good mixture of the contents. We hard pen and pencil as well as a note book that was used in reporting in and recording the events that were taking place as the experiment was taking place with time.

Table 1

Types of pesticides used in small-scale vegetable farms in Northern Tanzania, classified using the WHO Hazard Class and health effects, 2005

Trade Name	Common Name	WHO Class[a]	Health Effects[b]	Target pests	Registration status[c]
2-4D	2-4D amine	II		weeds	R
Actellic 50EC	pirimiphos-methyl	III	CI,SE, PC	weevils	R
Actellic Super dust	pirimiphos-methyl+permethrin	NK	CI, SE, PC	cutworms, armyworm stem-borer	R
Alto	Cyproconazole	III		leaf-rust	R
Ashes		NK		stem-borer, stalkborer	U
Bayleton	triadimefon	III	PC, SE	blight	R
Blue Copper	copper sulphate	II		leaf-rust, blight	U
Cobox	copper oxychloride	III		fungus	R
Cypercal	cypermethrin	II	SE, PC	larger-grain-borer	R
Decis	deltamethrin	II		fruit-borer	R
Diazinon	diazinon	II	CI	stalkborer, stem-borer, leafhopper, leaf-miner, beetle	R
Dimethoate	dimethoate	II		insects	R
Dithane M45	mancozeb	U	SE, C	fruitfly, blight, downy-mildew, leaf-rust, wilting	R
Dursban	chlorpyrifos	II	CI	stem-borer, cutworms, armyworm, bollworm, thrips, beetle, aphids, leafminer, stalkborer	R
Dynamec	abamectin	II		insects	R
Fenesta		NK		weeds	U
Fenom c		NK		thrips, insects, fruitrote	U
Funguran	copper hydoxide	III		leaf-rust	R

Tephrosia vogelii (Utupa) the leaves are used to make the pesticides as they appear in the picture.

The methodology adopted in this project was experimentation. We had experimental plots which were treated with the local pesticides and at different concentrations for both Mboyo seed pesticides and Tephrosia vogelii leaves pesticides. Other ridges remained untreated with any of the pesticides to act as control experimental plots. However, there was uniform application of Poultry manure where we added 200g in each hole having Brassica rapa seedling and irrigation of all the plots to get to good and representative results from the project Ruffo K et al (2002).

In this project we realized that the project worked and the hypothesis we had was to a great extent true. We planted our seedlings from the seedbed when they were 2 weeks time from germination. This was on 11th.June.2012 at 5:30 pm, continuous watering of all the ridges was done in the morning and evening. We did matching to reduce loss of water from the plants and the soil by transpiration. The seedlings that were used in the experiment and the entire projects were not treated with any pesticides at the seedbed to make them remain neutral.
In the second week after transplanting the seedlings; we applied the local plant pesticides to the experimental ridges but not to the control experimental ridges. The application of local plant pesticides was done after measuring the local plant pesticides using an electronic balance. This was done to all the two local plant pesticides used in the project (Tephrosia votelii leaves and Mboyo plant seed local pesticides).
There was treatment of the Brassica rapa seedlings with the local plant pesticides with different concentrations to enable us to realize the effect of concentration to the pests if any. To effect this; we measured the processed local plant pesticides using the electronic balance and then we dissolved it in a litre of water to be ready for application to the plants.

Conclusions:
The hypothesis guiding this project was "local plant pesticides can be used to curb plant pesticides". In this project we have realized that the two local plant pesticides worked quite well; we noticed a significant difference in both quality and quantity of the vegetables in the control experimental ridges and in the experimental ridges. Products were good in ridges treated with the local plant pesticides than in those without.
The vegetable used in the experiment Brassica rapa is mostly attacked by the caterpillars of the order Lepidoptera; caterpillars of moths and butterflies. Most butterflies and moth larvae feed on plants but different species feed in different ways. The larger larvae generally feed at the edge of the leaf and consume all but the larger veins; the smaller larvae eat small holes in the leaf (Delong M et al, 1976).
It this experiment as depicted in some pictures taken from the field; it is true that caterpillars survived in the ridges that were not treated with the local plant pesticides made. Some degrees of survival of the caterpillars were also noted in the ridges that had low concentrations of the local plant pesticides. In this way therefore, the effectiveness of the local plant pesticides is directly proportional to the concentration. It is therefore wise to have an intensive study on these two plants and many others to be able to use the local plant pesticides than the industrial ones which have shown many side effects to the environment and the living organisms including man himself.
However, it is necessary to study whether the caterpillars will be resistant to the local plant pesticides in future.

We highly recommend that farmers should now begin using the local plant pesticides. The two plants are locally available and they are found almost everywhere in the county. They are less expensive as compared to the industrial pesticides and also are environmentally friendly. Using these local plant pesticides in our fields will help reduce chances for breast cancer happening to most of our mothers in the villages due to exposure to harmful pesticides.
During the harvesting season we could eat the treated vegetables without any side effects noted and from the Government chemists' analysis the two products are said to have no potential side effects to mammals and are easily biodegradable. This means they are environmentally friendly.

References:
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Ruffo, K et al. (2002). *Edible wild Plants of Tanzania.* Nairobi: RELMA
www.wikipedia .com

Further information:
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