Exhibit Catalogue

AGRICULTURE

NATIONAL COUNCIL OF SCIENCE MUSEUMS

Mobile Science Exhibits

AGRICULTURE

designed and developed in 1979 at

BIRLA INDUSTRIAL AND TECHNOLOGICAL MUSEUM

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NATIONAL COUNCIL OF SCIENCE MUSEUMS

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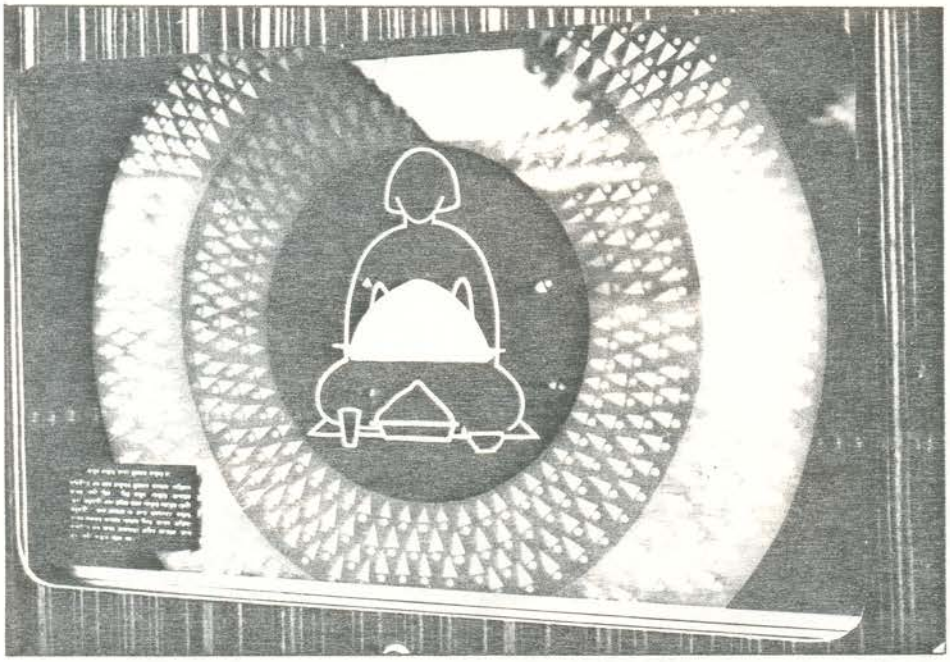
Exhibit No.1 Less Food More People to Feed

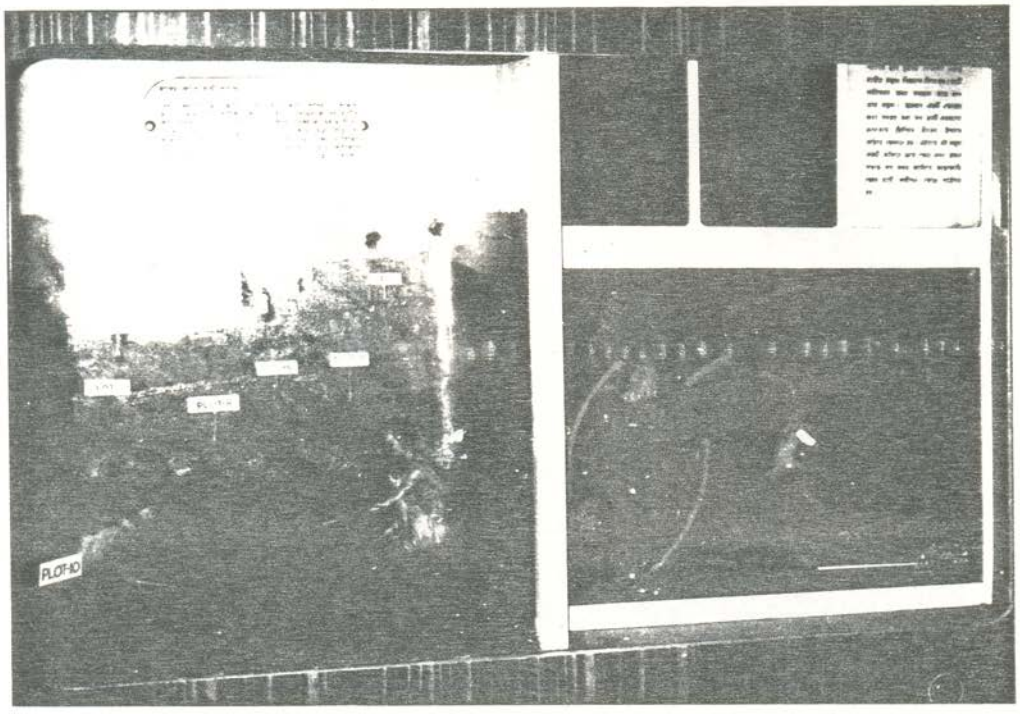


Man cannot live without food. In early days there was much more food than what the human population would require. But since then population has increased at a rapid rate in geometric progression while the rate of food production has increased at a lower rate in arithmetic progression. Hence to feed the growing population new technique for more food production from available land has to be adopted.

Exhibit No.2 Factors for Improved Agriculture

This exhibit emphasises on certain improvements in agricultural techniques for bringing high yields in food production.

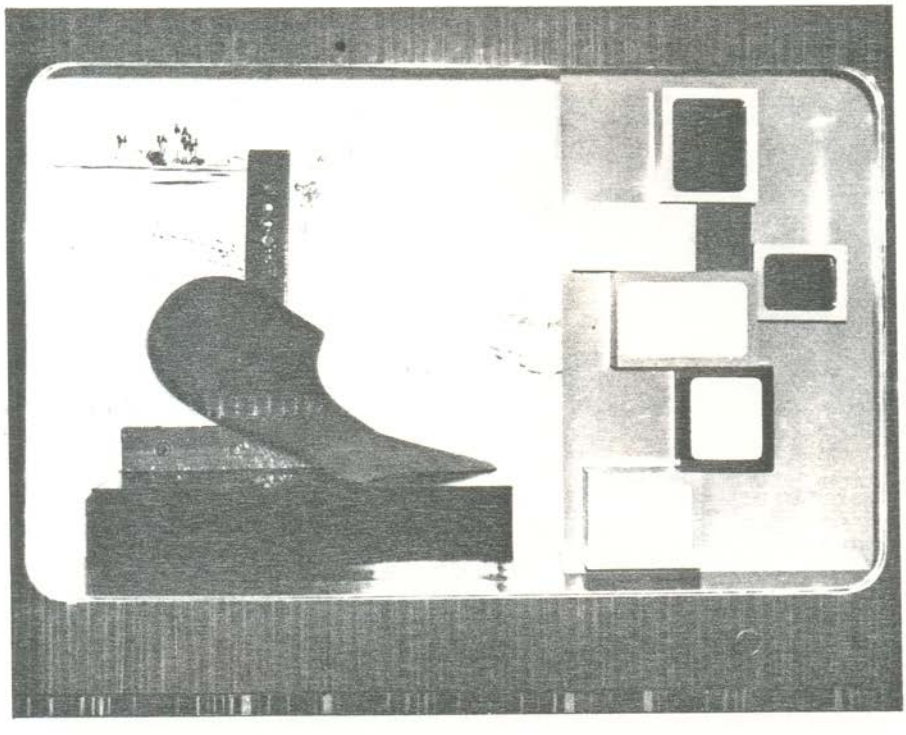
Exhibit No.3 Test Soil Before Land Preparation



To grow more food, fertilisers are used depending on the nature of soil. So soil must be tested first to decide the type and quantity of fertiliser to be used.

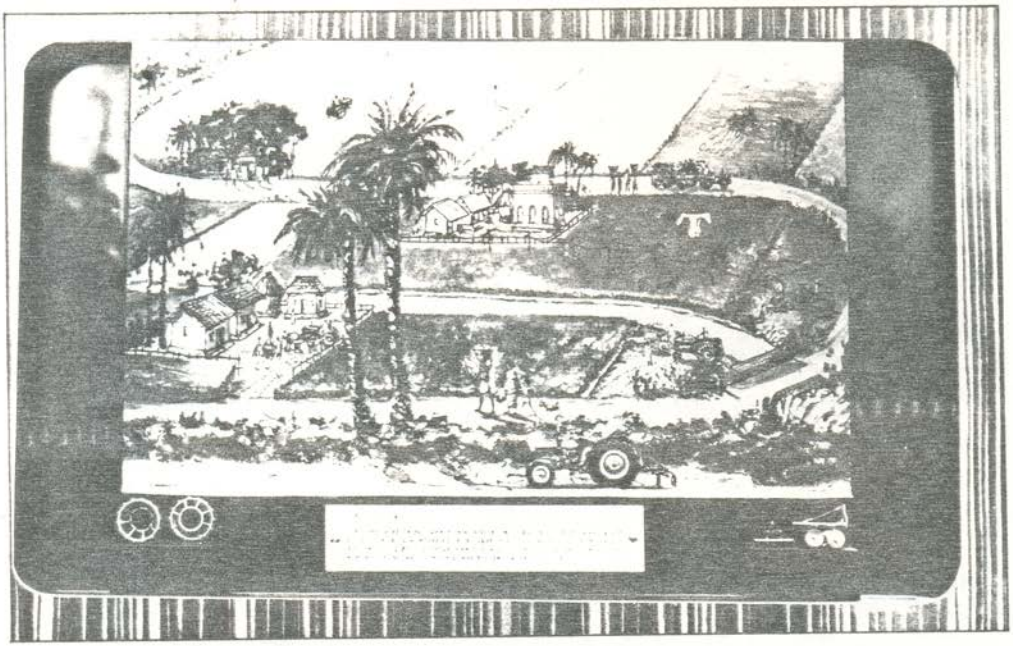
Samples of the same soil which is used for many grain varieties or which lies on high, low or medium land levels are collected from several places for testing. 500 mgs. of a sample is necessary for a single test. Small quantities of soils from different positions of the land are collected and mixed together and the final mixed sample is sent to the testing centre along with other details about the land and the grains to be produced.

Exhibit No.4 More Tillage in Shorter Time



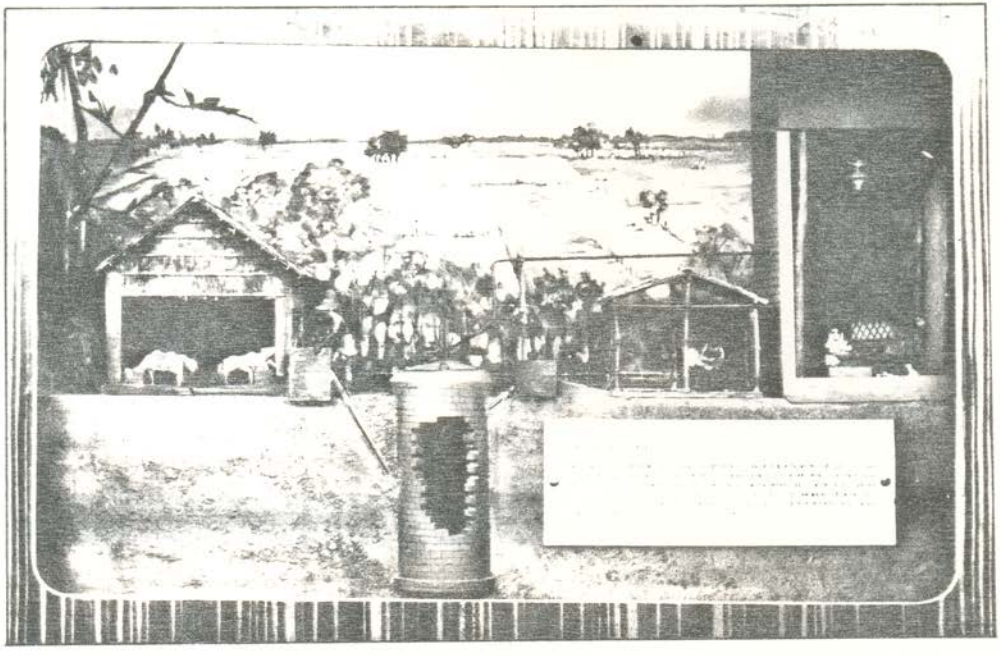
This is an improved type of plough used for tilling land in short time. Mould board type plough is better than local plough and makes the land tilled thoroughly and the grass weeds get suppressed under the soil and turn into natural manure. Healthy Oxen are not required to draw this type of plough. This method saves labour and cost and gives better result. It cuts the land thoroughly in U-shaped rather than V-shaped pattern, which keeps a portion untilled.

Exhibit No.6 Farmer's Best Friend Tractor



A tractor can be used for multipurpose works. It not only cultivates a land but also helps the farmer in the works of irrigation, harvesting, transportation of materials and even in lighting the houses if necessary with its various accessories. A tractor can till a land suitably with least time and labour for any type of plant products.

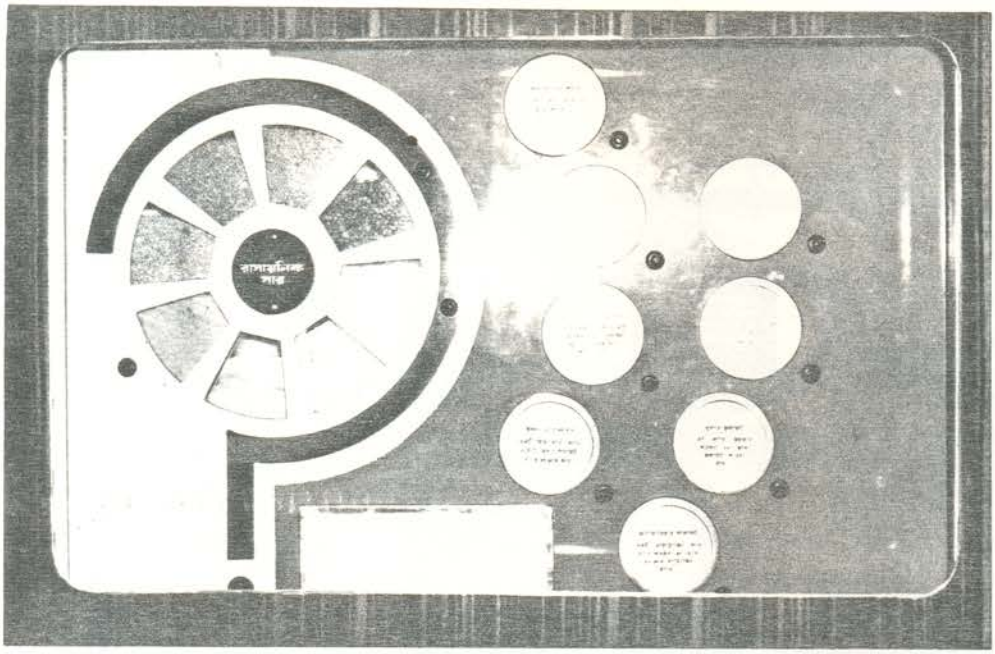
Exhibit No.7 Fertiliser and Energy From Same Source



Good organic fertiliser and biogas are prepared simultaneously from gobar gas plant.

Cowdung and urine of cattles are mixed with appropriate amount of water in a gobar gas plant and stirred thoroughly. These get decomposed into fertiliser and gas. The gas is collected in the upper portion of the container and fertiliser is collected at the bottom and passes out through the outlet. The gas is smokeless and odourless and can be used for cooking and lighting purposes. The fertiliser is taken out from the outlet and can be used with irrigation water or can be used for converting into 'Compost'.

Exhibit No.8 Your Chemical Fertiliser



All plants require some elements in varying amounts for their growth. Different amounts of essential elements are needed by plants during different stages of their growth. The deficiency of essential elements is made good by addition of manure and fertiliser. For proper use of mineral fertiliser one should know their composition, properties and the correct methods of using them.

In this exhibit samples of different fertilisers are shown with their composition. These include

a) Grower fertiliser 28: 28 : 0 containing 28 parts of each of N_2 and phosphate but no potash.

b) Sona - contains 25% N_2

c) Ammonium Sulphate - contains 20-21% Nitrogen

d) Murate of Potash - contains 58-60 parts of Potash

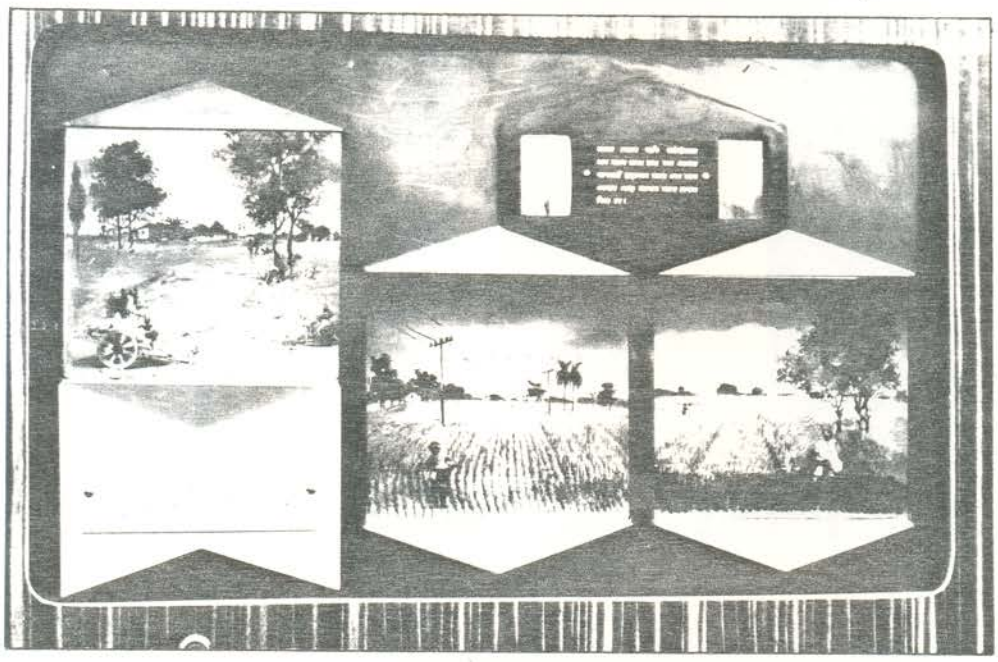
e) Sufala - 20 : 20 : 0

f) Urea - contains 46 parts of N_2

g) Sufala - 15 : 15 : 15

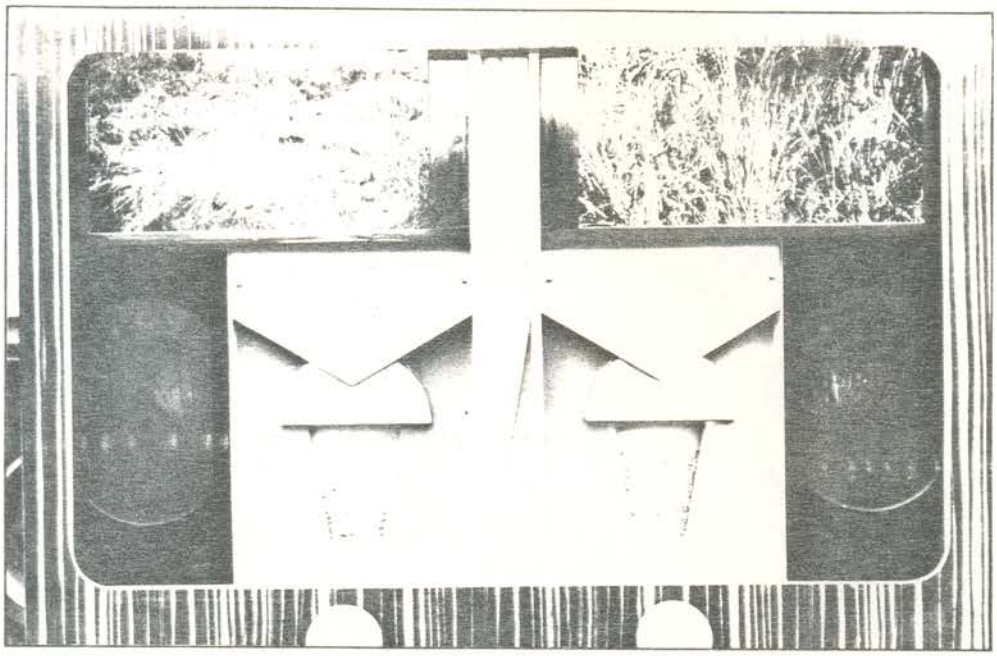
h) Superphosphate - contains 16% Phosphate in the minimum

Exhibit No.9 Apply Fertiliser Timely



Plants cannot grow well and do not give high yield, if proper fertiliser is not applied at proper time. For producing rice, jute and wheat, phosphate, potash and little nitrogeneous fertiliser should be applied during the last stage of tillage. For rice, the remaining nitrogenous fertiliser should be laid upon equally during branching and at the time of growing ears.

Exhibit No.10 Improved Seed, Improved Yield

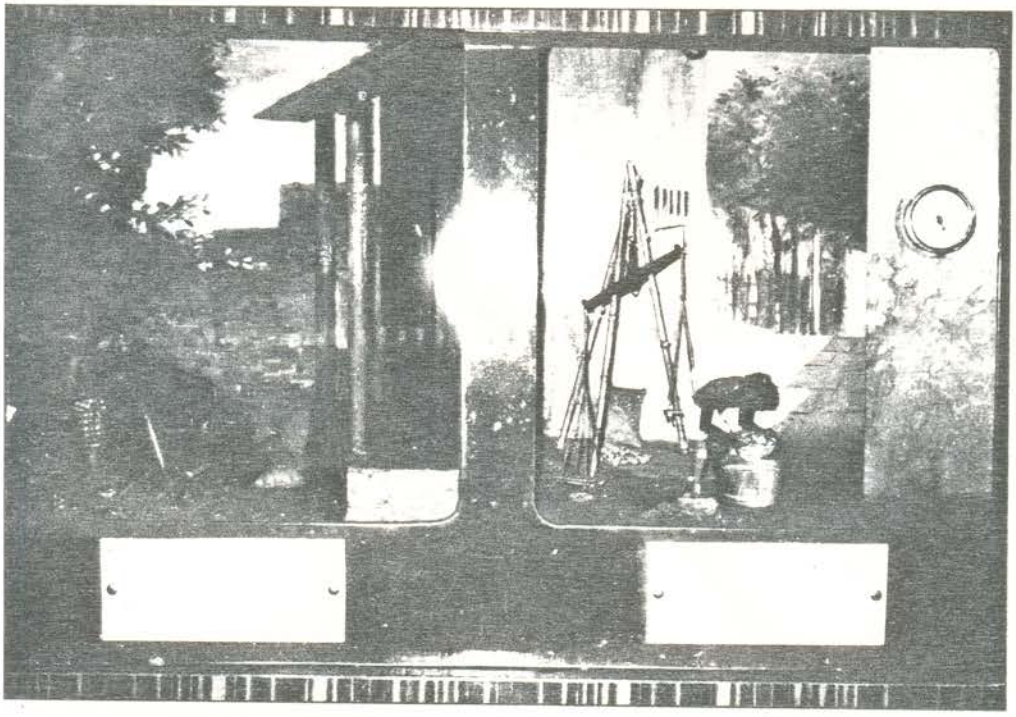


Fine rice obtained from indegeneous seeds grows only in specified period and takes a long time to mature. These rice plants absorb less fertiliser, branch less and the number of grains per shot is comparatively less and as a result the yield is low. The lower leaves do not get sun light due to leaning of upper leaves due to extra height. These plants are infected by fungi and the chances of damage to the crop for various reasons are more.

High yielding variety absorbs more fertiliser, these branch more with comparatively more number of grains. The dwarf variety is more disease resistant and hence gives more yield. As they ripe fast, this variety can be cultivated several times in a year in the same land.

Agriculture

Exhibit No.11 Seed Treatment and Plant Protection



Most of the diseases of plants are seed borne. So before sowing, the seeds are to be treated by different chemicals.

The exhibit shows how potato seeds are treated by chemicals and processed to avoid sudden attack of disease.

Full or cut potato seeds are dipped for a limited time in a container having appropriate amount of chemical solution and these are taken out. If these treated seeds are dried in shade and then planted, there is no possibility of sudden attack of any disease in future.

Exhibit No.12 Ideal Seedbed and Transplantation in Time

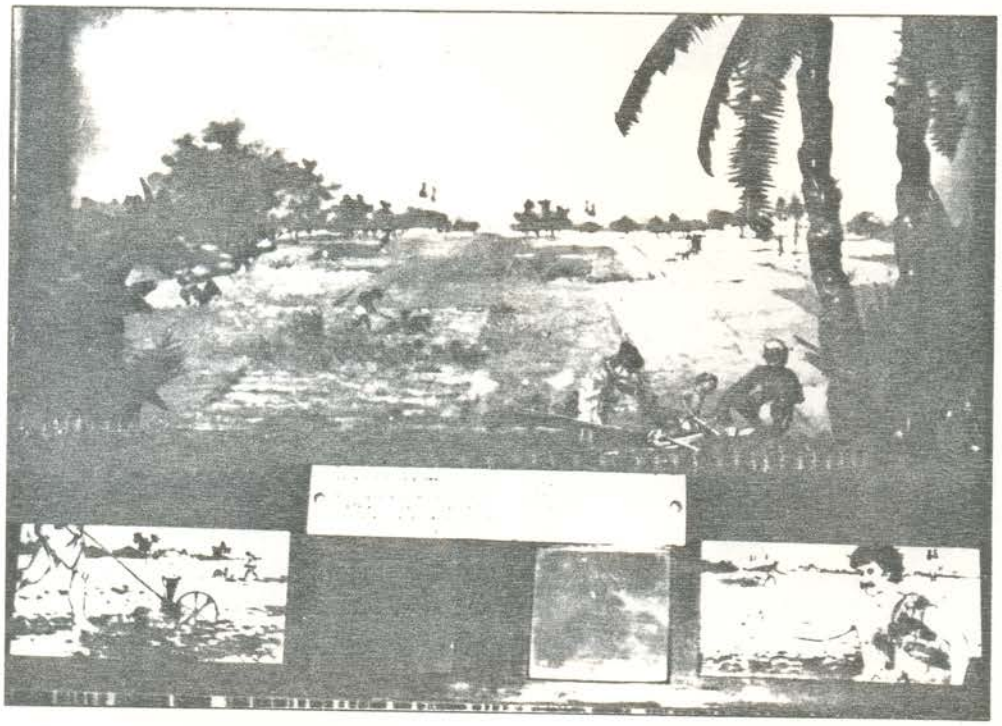
Preparation of seed bed is one of the most important factors for high yield and proper care is to be taken to prepare the same.

The exhibit shows the preparation of an ideal seed bed.

For one acre of land, a high seed bed of about one tenth of its size is required. Each seed bed should be 25 feet in length and 8 feet wide with an irrigation channel of one foot width and four inches depth all around the seed bed.

For better yield, saplings are sown in lines at equal distances so that cleaning of weeds and application of manures and medicines are also done easily. The saplings of rice are most easily sown in rows with the help of a thread.

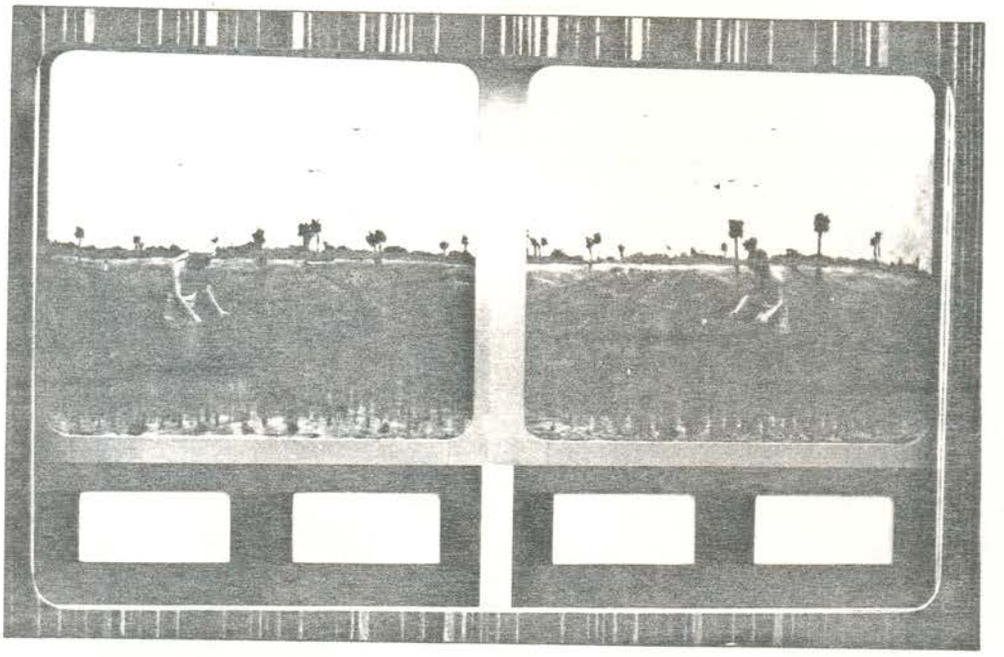
Exhibit No.13 Sow in Line, Use Seed Drill



These are different methods of sowing seeds. But if the seeds are sown in lines, it is easier to take proper care.

Seeds of wheat, jute and rice are sown in rows with proper gaps with the help of seed drills. Such method requires less seed and minimum expenditure. All plants grow equally and give better result.

Exhibit No.14 Remove Weeds and Use Machineries



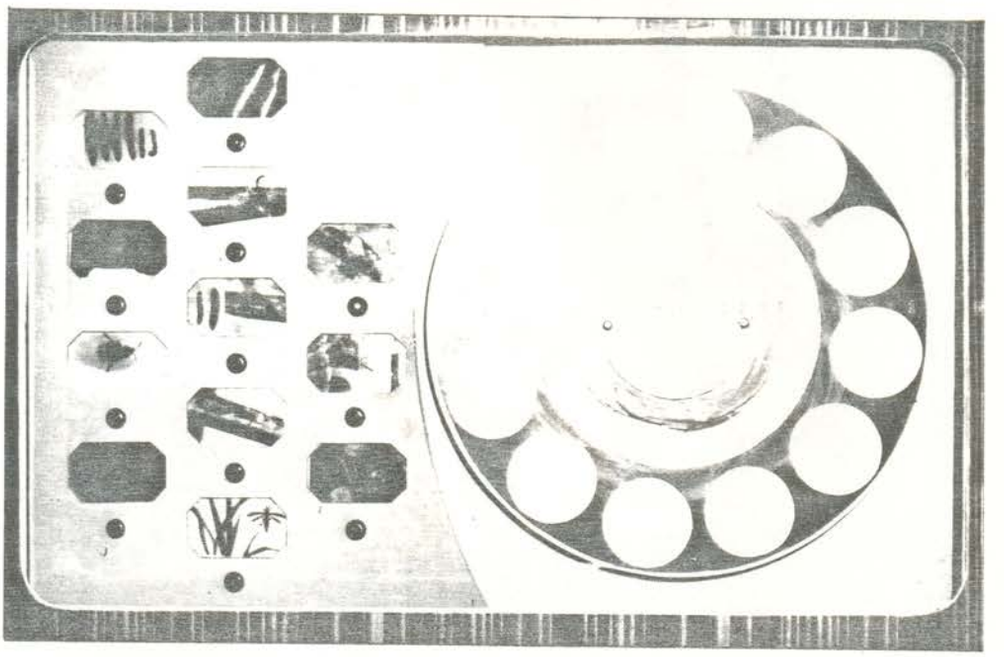
The weeds retard the growth of plants as they consume a large portion of the nutrients. So for better yield, the land must be free from all weeds.

With the help of machine, weeds can be easily removed in less time by less labour and can be converted into green fertiliser.

The wheel hoe is usually used for clearing weeds from dry soil.

The exhibit explains how with the help of wheel hoe the soil is ploughed along with the clearing of the weeds while keeping the nutrient in the soil as it is. And this helps to increase the yield of the crop.

Exhibit No.15 Farmer's Enemies - The Insects, Pests



There exists a large group of diseases caused by parasite, bacteria, virus, pest and insect producing tremendous loss to the farmers.

The exhibit shows the different types of insects, pests etc. causing damage to the plants. These include :

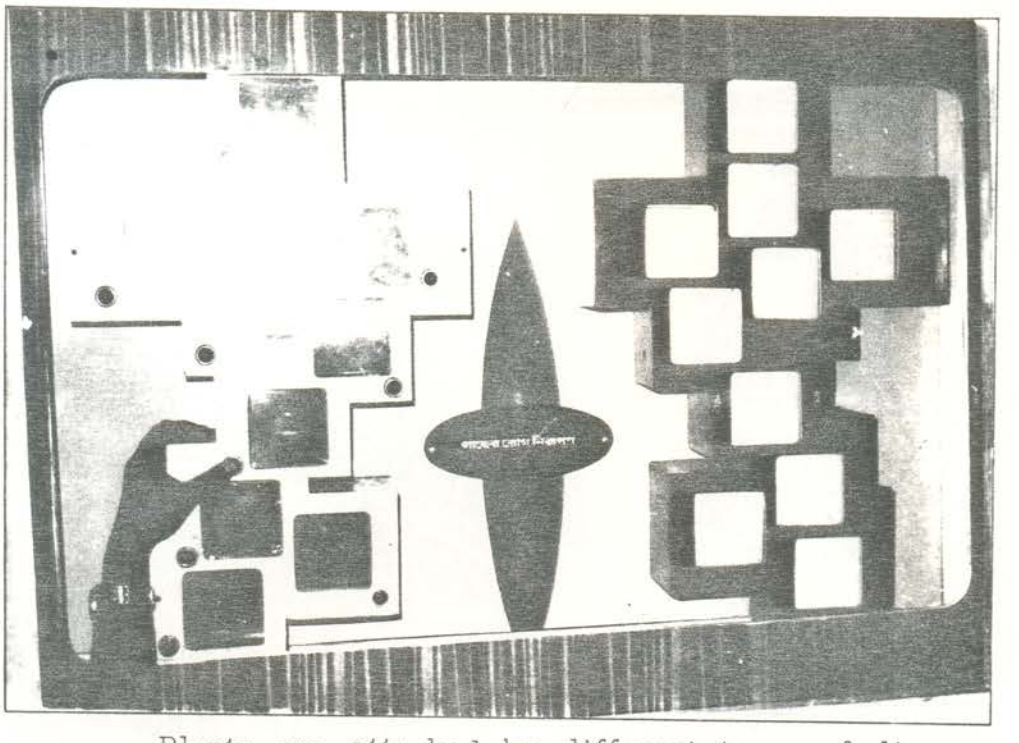
a) Attack by stem borer b) Rice Hipsa insect

c) Swarming caterpillars d) Padigol flies

e) Leaf joint word f) Limatode g) Greenish light attracted worm h) Brown plant hopper i) Red insects

j) Trips k) Rice bug l) Stem borer

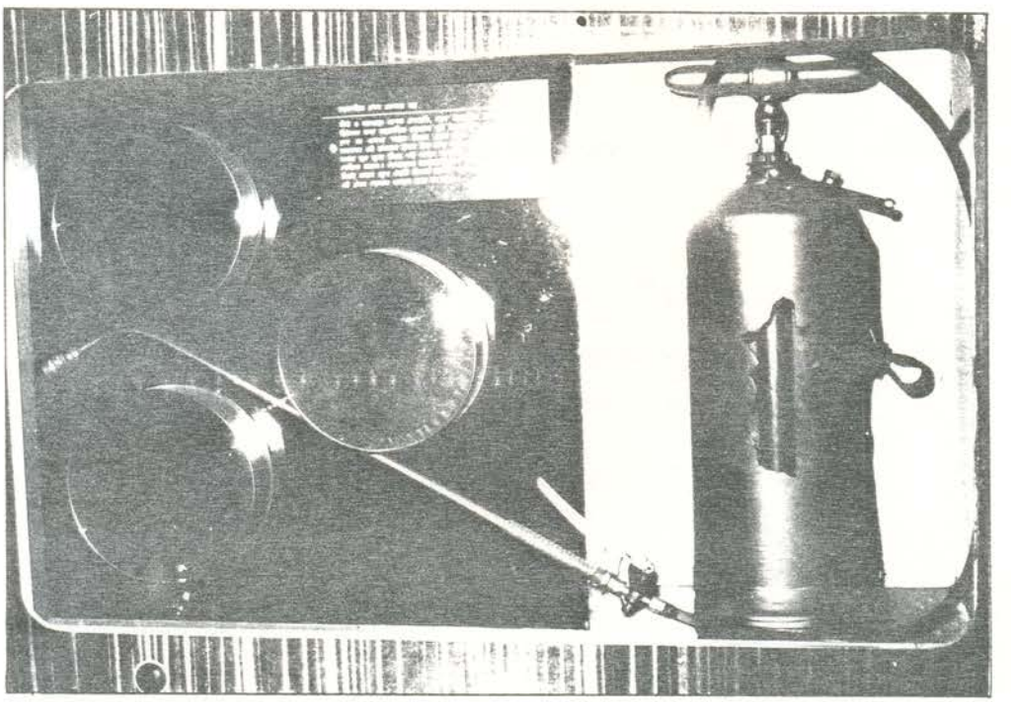
Exhibit No.16 Diagnosis of Plants Disease



Plants are attacked by different types of diseases. These diseases develop symptoms. By observing the symptoms, the diseases can be diagnosed. In this exhibit symptoms of different diseases are shown. These include :

a) Kuthe disease (Tungro Virus disease) b) Leaf drying disease c) Spot disease of banana plant d) Disease caused by bacteria e) Leaf roasting disease f) Sheet blight g) Roasting disease of paddy stem h) Stem rot disease of the paddy i) Late blight disease of potato.

Exhibit No.17 Use Sprayer to Protect Plant



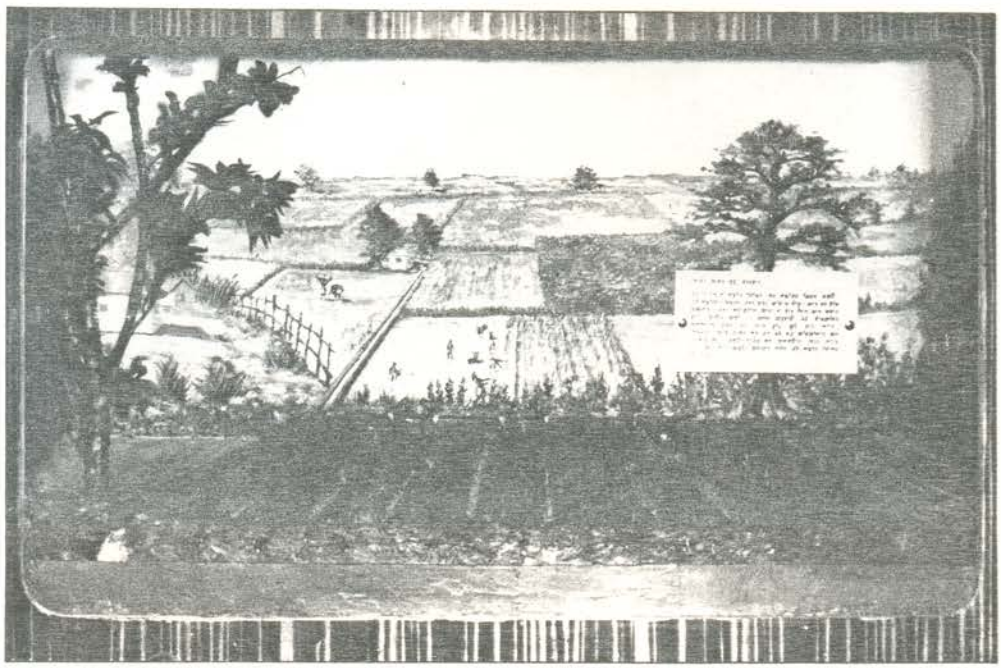
Pesticides and insecticides are sprayed to protect the plant from the attack of insects.

Hand driven sprayer is useful in spraying liquid manures and pesticides. The solution to be sprayed is to be filled in the sprayer and a pressure is created on the fluid by means of hand pump. When the outlet is opened, the solution comes out in the form of vapour. When herbicides is to be sprayed, a special strainer is to be used in the outlet to prevent the contact of herbicide with the plants.

Exhibit No.18 Two-in-One

This machine can be used for quick application of medicine in a large land. The main advantage of this motor driven machine is that it can spray the medicine both in liquid and solid granular form.

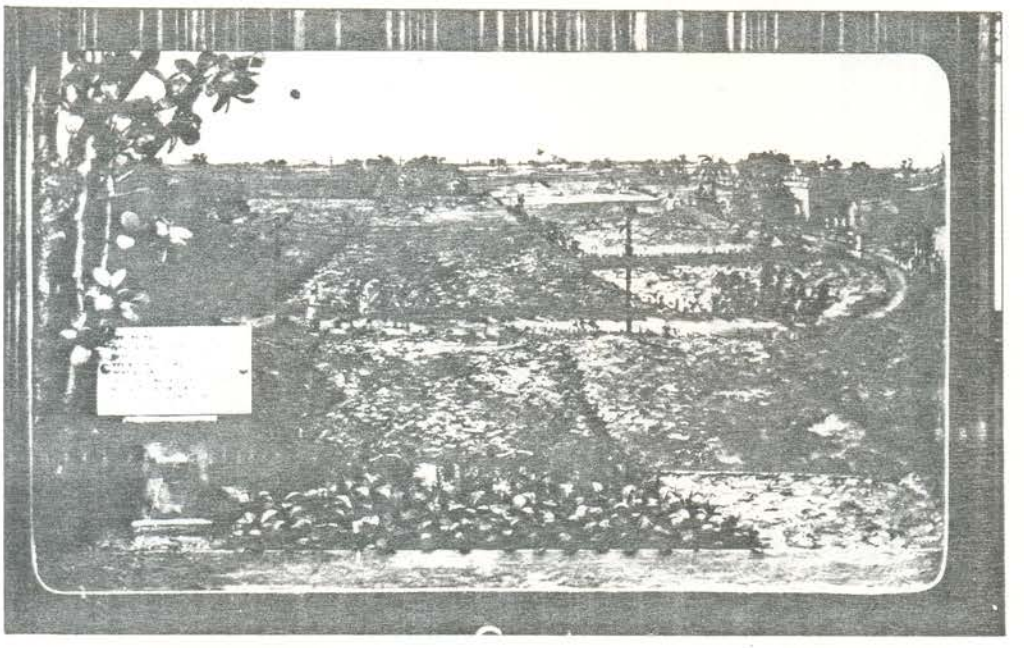
Exhibit No.19 Proper Use of Water in Irrigation



These are different methods for supply of water in the field.

'Border-strip' technique is one such irrigational process. In this method, the plane and even land is to be divided by low and parallel (about six inches high) borders. The distance between two borders varies from 10' to 20' according to the nature of crop and land. Water is flown into these divided lands through the irrigation channels. Water cannot go from one land to another land area. This method is very useful in cultivation of Jute, Wheat etc.

Exhibit No.20 Best Method of Irrigation

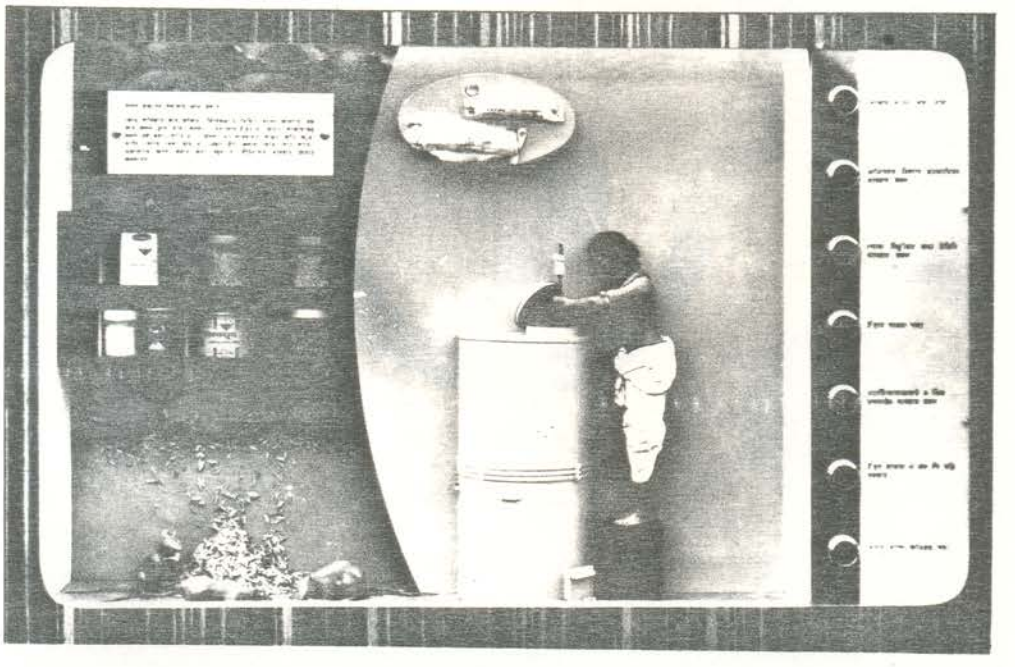


Of the various methods used to irrigate the field the sprinkler irrigation process is the best of all although the initial cost is high. The water is sprayed in the form of rain drops and fall evenly everywhere and the soil condition is not disturbed. This process is very useful for uneven land and also for the land which has a tendency to land erosion.

Exhibit No.21 Crop Threshing by Machine

Crops can be threshed by manual power, animal power or by machine. Traditional methods need much labour, time and manual power. Sometimes one has to depend on nature. But threshing by machine takes less time and expense. The machine which is shown at the left side of the exhibit is to be driven by leg and the grains of rice and wheat can be threshed well quickly. The instrument at the right side is run by motor and threshing as well as seperation of the corns from the straws can be done simultaneously without damaging the straws.

Exhibit No.22 Best Way to Store Crops



A large quantity of crops is damaged by insects and eaten by rats. So care should be taken to store the crop to minimise the damage.

The crop should be threshed, cleaned, dried and then stored in a specially built metal container. In this way the crops can be protected from rats and insects. In spite of this, some small microscopic insects may remain with crop. The application of pesticides is the best way to kill them all. Following insecticides may be used for the purpose.

For grains eaten by insects -

i) Malathian may be used as a preventive care

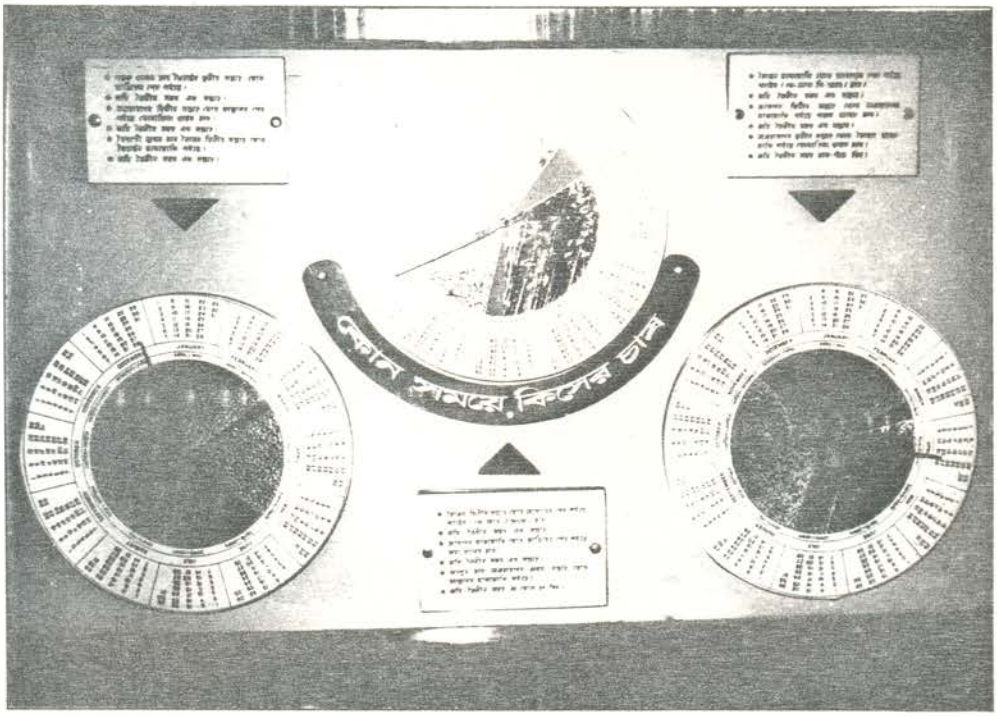
ii) EDB to eradicate insects

For grains eaten by rats -

i) Use antiquagulant and Zinc phosphide

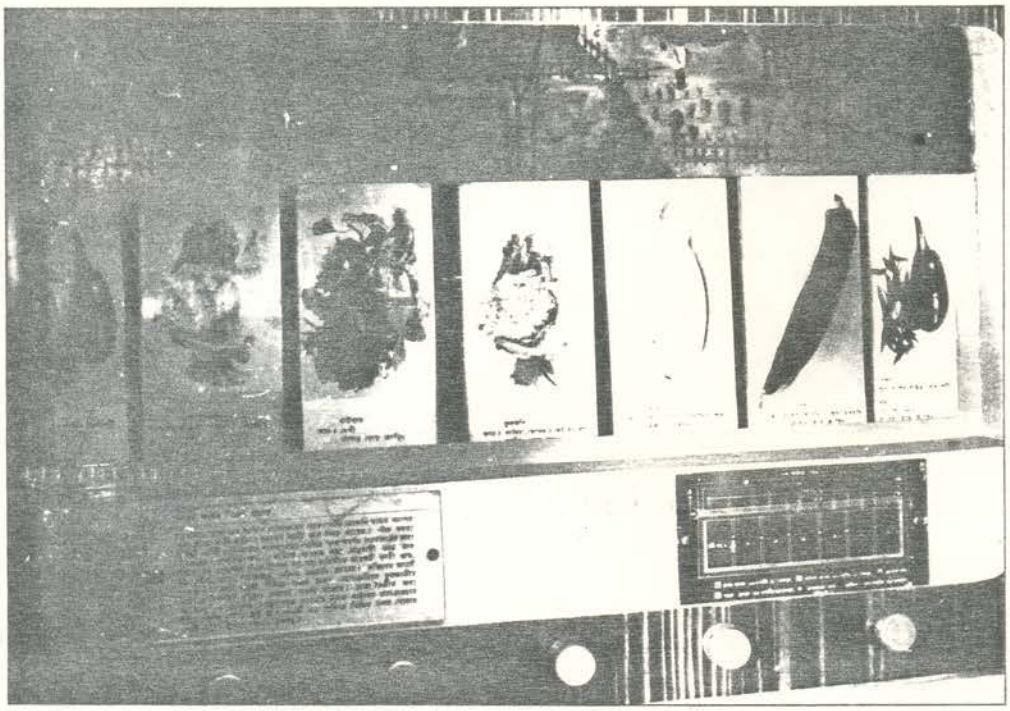
ii) To kill rats use ALP tablet

Exhibit No.23 Round The Year Cropping Pattern



Different crops grow at different times of the year. The cultivation of crops depends on temperature, rainfall and humidity. An annual time chart has been prepared showing time when to prepare land and to cultivate different crops. The crops include a) Jute b) Jaya rice c) Potato d) Pankaj rice e) Sonalika wheat.

Exhibit No.24 Grow Your Own Vegetables



Vegetables can be grown for daily use in the spare land beside your house. For daily use for 5 members of your family use 3 Kathas of land and divide it into sections as in the plan shown in the exhibit. Then plant some permanent trees like banana, papaya, lemon in the northern section of the garden. In the section 7 of the southern side, grow vegetable throughout the year. Plant root supported vegetables on the border and creeper plants by the fences all around.