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Mixing insecticide powders with grain for storage

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Mixing insecticide powders with grain for storage

P Golob

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Introduction

This guide describes ways of mixing insecticidal powders with grains and pulses just before they are stored in order to prevent damage by insects.

It is a guide for the extension worker to help him introduce the methods to farmers. The pictures with descriptions on the right-hand pages show the steps involved. The left-hand pages give a more detailed explanation of the methods.

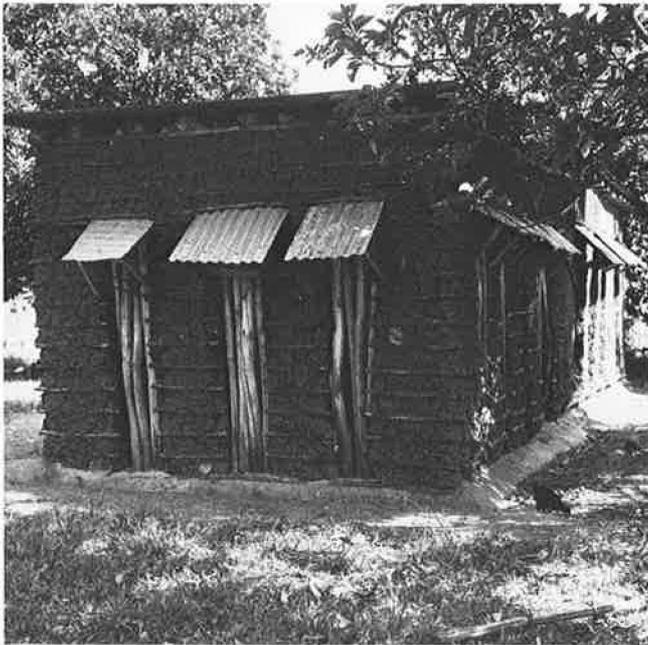
The methods described in this guide apply only to grain that the farmer is going to eat and not to grain he keeps for seed.

The problem for farmers after their harvest

All over the world farmers store their grain and pulses after harvest. During storage their produce is often attacked and damaged by insects. Putting produce into a store or a sack does not prevent this. However, damage could be largely prevented if insecticidal powders were mixed with it.



Although grain stores differ in size and shape, those illustrated represent five common types. The methods described apply to all types of store.



What you need

a Insecticidal Powders

You can buy powders that kill insects, in ready-to-use packets for mixing with cereal grains, pulses and groundnuts. If you spend money to buy this powder then you must take care to apply it in the proper way. If you apply it wrongly the powder will not be effective and your money will have been wasted. Provided that you mix the powder evenly with the grain it will protect the grain from insect damage for several months.

The directions on the packet will tell you how much powder to use. These packets usually contain sufficient powder to treat one or more full sacks of grain. If you use too little the powder will be ineffective and if you use too much it is wasteful and the grain may not be safe to eat. Use only the powders labelled for mixing with food grains; *powders labelled for treatment of seed grain should never be mixed with grain intended for food.*

b Powder sprinklers

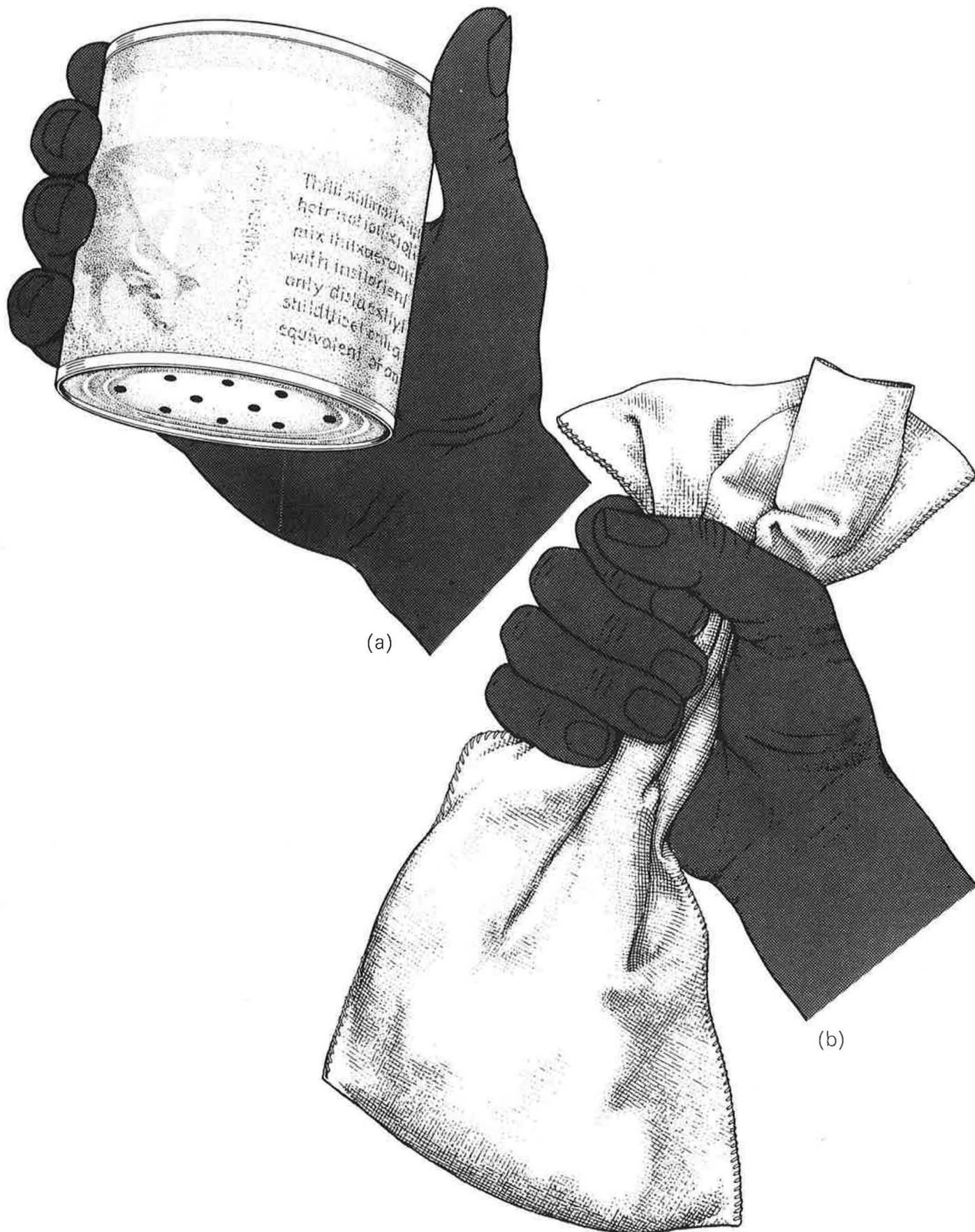
When you treat layers of cobs or grain with powder or when you are sprinkling your store with powder you must apply an even layer of the powder. The powder is best applied using a powder sprinkler made from a tin or a piece of sacking.

You can make the powder sprinkler shown in figure a from a tin; a dried milk tin is ideal. The tin must have a lid and be clean. Make about ten small holes in the bottom of the tin with a 5 cm (2 inch) nail or similar pointed tool.

The other type of sprinkler shown in figure b is a small bag about 30 cm × 40 cm (12 in × 16 in) made from an old sack. To make this bag cut off a piece of sacking 60 cm × 40 cm (24 in × 16 in). Fold the bag in half and then stitch up the two opposite open sides.

When you pour the powder into the tin or bag sprinkler and then shake it gently, a fine layer of dust is produced.

Two types of sprinkler. You can make a sprinkler from (a) a tin or (b) a piece of sacking.



Preparing the store before applying the insecticidal powder

If you have any grain left in your store from the previous year, remove it from the store, clean it and treat it with powder to kill insects in the way that will be described. Do this even if it was previously treated when you first stored it. Keep this grain separate from the new season's crop and use it up first.

Before putting your harvest into the store the store must be repaired and then cleaned. After you have repaired and cleaned your store put some powder into the bag or tin sprinkler and shake it so that the walls and floor are covered with a layer of powder. This will kill any insects still hiding in the cracks.

Preparing the produce before applying the insecticidal powder

If you are storing maize cobs they should be fully ripened and sufficiently dry. It is better to take the sheaves off the cobs but this is not essential.

If you are storing shelled grain then complete the drying and threshing of your grain as soon as possible after harvest. Then clean the threshed grain (before it is treated with powder) by winnowing or sieving it to remove dust, husks, insects and sand.

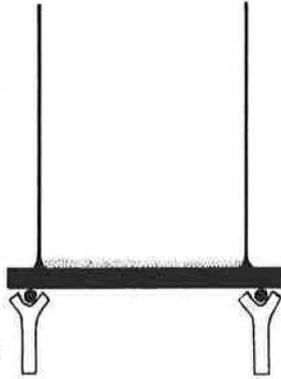
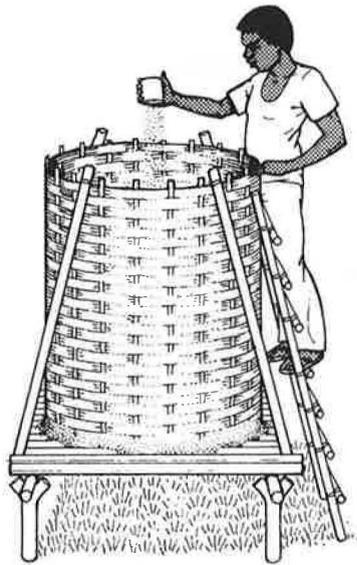


How to treat maize on the cob

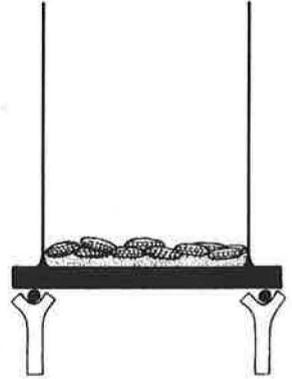
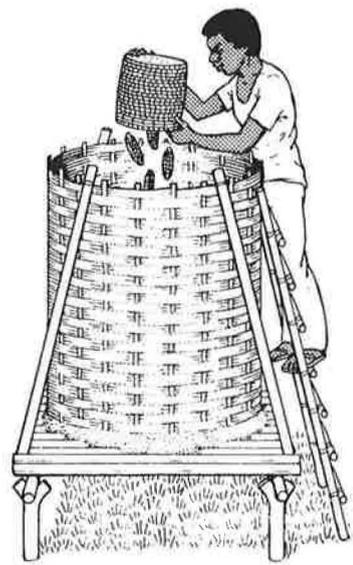
Treat your maize cobs layer by layer as you put them into the store rather than before you put them in, because you will avoid wasting the insecticidal powder.

1. Sprinkle the inside walls and floor of the store with a layer of powder that kills insects.
2. Completely cover the floor of the store with a layer of cobs.
3. Sprinkle more powder evenly over the layer of cobs so that the cobs are covered with a fine layer of powder.
4. Put another layer of cobs on top of the first layer.
5. Sprinkle this second layer of cobs with powder as you did the first layer.
6. Go on filling the store with a layer of cobs and sprinklings of powder until the store is full.
7. When you have filled the store or finished putting all your cobs in, cover the top layer with a thick coating of powder and then close the store in the usual way.

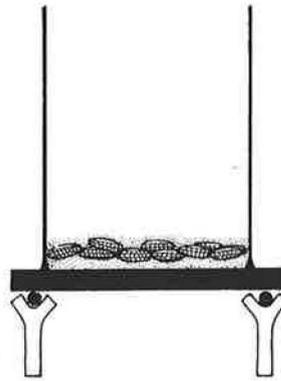
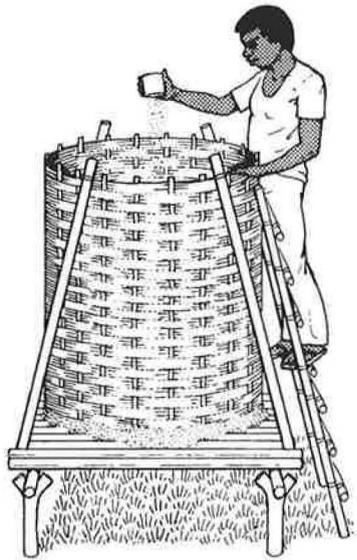
You can treat other produce that is stored unthreshed in the same way, for example, finger millet, bullrush millet and sorghum stored on the head.



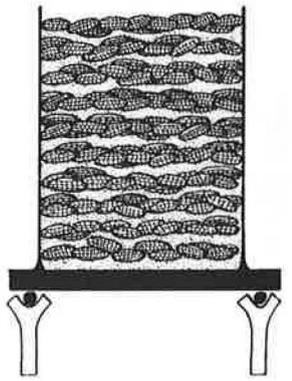
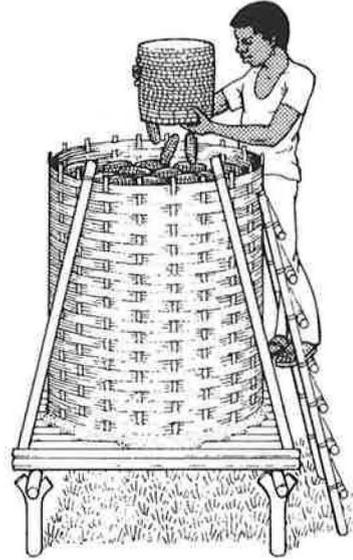
Sprinkle the inside walls and floor with a fine layer of insecticidal powder.



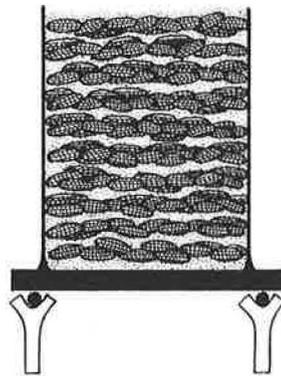
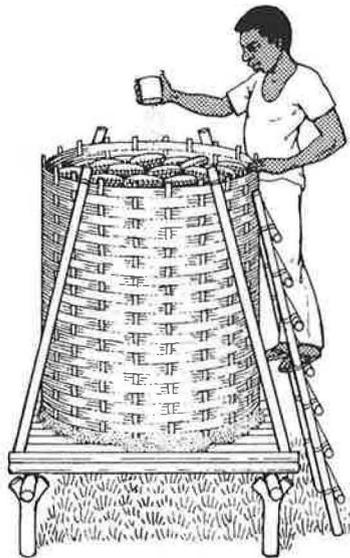
Completely cover the floor of the store with a layer of cobs.



Sprinkle more insecticidal powder evenly over the layer of cobs.



Put in more layers of cobs and sprinkle each layer with insecticidal powder.



When you have put in all the cobs, cover the top layer with a thick coating of insecticidal powder.

Treatment of threshed grain

There are three different methods for mixing insecticidal powder with threshed or shelled grain, these are:—

- a mixing with a shovel
- b layer by layer treatment
- c mixing by stirring

You can use these methods to treat wheat, sorghum, millet, maize, groundnuts, beans, cowpeas, butter beans and other threshed crops.

a Mixing with a shovel

This is a quick, easy method for mixing powder with grain heaped on the floor.

If you have a concrete floor you can do the mixing on the floor itself. If the floor is earth then you must empty the grain on to a polythene or metal sheet or on to a tarpaulin spread on the floor and not on to the bare earth.

You must sweep the concrete floor, polythene or metal sheet or tarpaulin clean before you start.

Treating one or two bags at a time

See drawings opposite

Using this method you can treat up to 180 kg (400 lb) at a time.

1. Empty one or two bags of grain on to the floor, sheet or tarpaulin.
2. Sprinkle the correct amount of insecticidal powder all over the heap. You can pour the powder straight from the packet.
3. Using a clean shovel gently mix the powder into the heap until all the grains are evenly coated. If you do not have a shovel, then a large bowl or flat piece of wood will do.
4. When you have finished mixing you should not be able to see any patches of powder in the heap.
5. Bag the treated grain and put it straight into your store.



Empty the bag of grain on to the floor in a heap.



Sprinkle the correct amount of insecticidal powder all over the heap.



Using your shovel, gently mix the insecticidal powder into the heap until all the grains are evenly coated.



When you have finished, you should not be able to see any patches of insecticidal powder.

Treatment of larger quantities

See drawings opposite

Using this method you can treat up to 1000 kg (2200 lb) at a time.

1. Empty the grain on to the floor.
2. Sprinkle the correct amount of grain on to the heap.
3. Using a clean shovel, mix the powder into the heap as well as you can.
4. Shovel the whole heap to another part of the floor, then shovel it back again. You must move the whole heap twice to make sure the powder is properly mixed in with the grain.

b Layer by layer treatment

This method is suitable for treating grain while you are filling the store. The way to do it is very similar to that described for treating maize on cobs.

1. Sprinkle the inside walls and floor of the store with a layer of insecticidal powder.
2. Pour the grain into your store and spread it to a depth of about 10 cm (4 in).
3. Sprinkle insecticidal powder evenly over the layer of grain.
4. Add more grain to form a second layer about 10 cm (4 in) deep.
5. Sprinkle this second layer of grain with powder as you did the first layer.
6. Go on filling the store with layers of grain and sprinklings of powder until the store is full or until you have used all your grain.
7. When you have finished treating the grain close the store in the usual way.

c Mixing by stirring

Another method for treating grain in the store is by mixing the contents of whole bags with the correct quantity of powder.

1. Sprinkle a layer of powder over the walls and floor of the store.
2. Empty a bag of grain into the store.
3. Pour the recommended amount of powder over the surface of the grain.
4. Using a long stick — one about 1 metre × 5 cm (1 yd × 2 in) long is suitable — stir the grain and the powder together until all the powder is thoroughly mixed with the grain.
5. Empty a second bag of grain into the store and a further amount of powder.
6. Stir again until the powder is mixed with the grain.
7. Empty further bags of grain and packets of powder into the store and mix this together until the store is full or all the grain has been treated. Close the store.

If the store is wide you can empty more than one bag of grain into the store before adding the powder. (This method is rather hard work and it is difficult to get a good mixture.)



Empty the bag of grain on to the floor in a heap.



Sprinkle the correct amount of insecticidal powder over the heap.



Shovel the heap to another part of the floor.



Then shovel it back again.



When you have finished, you should not be able to see any patches of insecticidal powder.

Safety

1. After you have handled insecticide *always* wash your hands and other parts of your body that may have got powder on them.
2. Store any unused powder in a closed airtight container in a cool, dry place, away from the treated grain and where it cannot be reached by children or domestic animals.

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Golob, P (1977) Mixing insecticide powders with grain for storage. *Rural Technol. Guide, Trop. Prod. Inst.*, no 3, 14 pp.

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Future Guides

The Institute would be glad to receive suggestions for new devices and techniques which might usefully be described in future publications in this series.

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