



World Food Programme
SOP for CONTRACTED FUMIGATION

Standard Operating procedures for contractors undertaking phosphine fumigation and insecticide spraying in WFP stores

(revised Nov. 2003)

A. Initial preparations

1. Measure up the store for fumigation/spraying and determine required dosages with reference to current standing instructions. If the fumigation includes any empty space then the dosage rate must be calculated on a volume rather than tonnage basis. For spraying, the calculation is based on the area of the godown floor and walls and bag stack surfaces (including the top of the stack).
2. The current recommended dosage rate for phosphine is 2g of gas/tonne or 1.5g of gas/m³. Small increases in dosage rate may be acceptable if the target gas concentration on day 5 is difficult to achieve (see below) although this should not normally be necessary. Quotations based on the use of aluminium phosphide in sachets as well as or instead of tablets are welcomed. Approved residual insecticides should be applied at the manufacturer's recommended rate.
3. Confirm that there are no human habitations within 100m of the planned fumigation; if there are then check that arrangements can be made for people to be relocated during the treatment.
4. Check that stacks can be sheeted and that there are no store imperfections, e.g. cracks in the floor, unfilled floor joints, roof leaks etc, which might jeopardise the success of the fumigation. Expectation of adverse weather, such as high winds must be taken into account since these may prevent adequate phosphine concentrations being achieved.
5. Check that the surfaces of floor, walls and bag stacks are clean and free of food residues.

B. Sheeting stacks

1. Use good quality fumigation sheets.
2. Before sheets are placed on a sack secure two nylon gas-sampling lines, a long one that comes from the top of the stack close to the middle and a short one from the side of the stack just above ground level.
3. After placing sheets on the stack(s), check for holes and repair any that are found using spare pieces of fumigation sheet and suitable glue.

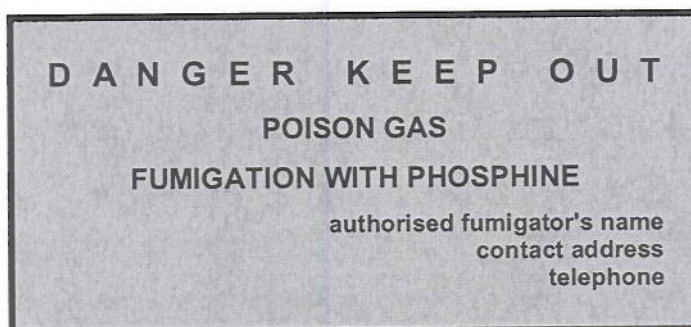
4. If it is necessary to use more than one sheet on a stack then join sheets with a flat joint and secure, preferably with clips.
5. Place any store residues or sweepings in a sack under the fumigation sheet.
6. Ensure that sheeting at the corners of stacks is well pleated so that it lies flat and does not allow gas to leak easily.
7. Seal corners of stacks to the floor using a double row of heavy sand snakes
8. Anyone present who is not a member of the fumigation team should now leave the store.

C. Adding the fumigant

1. Open aluminium phosphide containers with caution and handle tablets only with gloves. If there is danger of inhalation of aluminium phosphide dust then a dust mask must be worn.
2. If using aluminium phosphide tablets or pellets these must be in a single layer on trays or alternatively in envelopes. Place the fumigant under the sheeting, preferably beneath the pallets, in a manner that will not result in any contamination of stored food with residues. If using sachets, suspend these from the sides of stacks. Fumigant must not be placed on top of stacks unless there is insufficient space below.
3. Seal the remainder of the fumigation sheet to the floor using heavy sand snakes that overlap by at least one third of their length. Wooden poles or metal chains are not acceptable for this purpose.

D. Closing the store and displaying safety warning

1. Leave the store then close and lock all doors.
2. Place warning notices on all doors with an appropriate warning symbol with a text in English and the local language (s) as below. The authorised fumigator's name and contact address and telephone number should be at the foot of the notice.



E. Duration of Fumigation

1. Five days is the minimum fumigation period when average temperatures are at 25° C or above.

F. Checking the gas concentration

1. On the fifth day of fumigation, a member of the pest control team, wearing a gas mask fitted with the appropriate phosphine canister, should enter the store to measure the concentration of phosphine from the two gas sampling lines. As a safety precaution, a second member of the team should stand at the door to watch the one who is measuring the phosphine concentration. The phosphine concentration must be measured with a Bedfont electronic phosphine meter (EC80 or better) calibrated by the manufacturer to give optimal reading in the range of 100-200 ppm. The said meter will be recalibrate at the frequency specified by the manufacturer (currently every 6 months).
2. The fumigations will only be recorded as successful if the phosphine concentration at 120 h (5 days) is at or above 150 ppm (0.1 mg/l) from both gas-sampling lines.

G. Airing the store and food stocks

1. Fumigation team members should open all doors and ventilators.
2. They should enter the store, wearing gas masks fitted with the appropriate phosphine canister, and should remove all sand snakes and pull back the sheeting from about one third of the stack.
3. Fumigation team members should then leave the store for at least two hours. After this time they may return wearing gas masks to check that the phosphine concentration is at or below 0.3 ppm. The use of gas detector tubes is required for the verification of safe conditions in the warehouse, since these enable the accurate measurement of very low phosphine concentrations. Once safe conditions have been verified gas masks may be removed and other staff allowed to enter the store.
4. Fumigation sheets may now be removed from stacks, folded and taken out of the store.
5. All phosphide residues must be removed from the store and disposed of safely, e.g. buried to at least 50 cm.

H. Spraying with pesticide

1. Walls and floors and bag stack surfaces should now be sprayed with an approved residual insecticide at the manufacturer's recommended dosage.

2. Floors and walls should be treated until run-off, bag stacks should be given only a light uniform coverage of sides and top.
3. It is acceptable to spray the store structure only, when fumigation sheets are on the bag stacks and just before fumigant is introduced. In this case no spray treatment would be applied when the fumigation sheets are removed.
4. Routine treatment of warehouse with residual pesticide is considered to be of little value and would not normally be required by WFP.

I. Recording the treatment

1. The date and nature of treatment should be recorded on the Stock Card of every bag stack.
2. A Fumigation Certificate, for each stack treated, should be submitted to WFP. This must indicate the tonnage treated, the dosage rate and fumigant preparation used and the phosphine concentrations recorded at each of the two gas sampling lines in each stack at 120 hours. Details of the active ingredient and dosage rate of the associated residual insecticide spray treatment must also be included.

J. Supervision of the fumigation

1. The registered fumigator will be present for the supervision of all fumigation and spraying activities.

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