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AEROSOLS IN AGRICULTURE

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## AEROSOLS IN AGRICULTURE

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State Prize Laureate

Both Soviet and foreign experience has shown that crop storage is impossible without using chemical protective agents. However, every chemical method of controlling parasites yields the best results only when all the necessary agrotechnical measures are taken for growing and storing agricultural produce properly.

Chemical agents are applied by spraying, dusting, and gas decontamination. The aerosol method is the most productive of all.

In agriculture aerosols are used in the form of fogs - small drops 1-50 microns in size in which pesticide is dissolved.

When grain is removed from warehouses special smoke pots are used to exterminate insects; the active ingredient is technical hexachlorane or an enriched gamma-isomer of hexachlorane.

A special fuel mixture is used to sublimate these chemicals. The "Gamma" pots contain a technical product of hexachlorane and the "Gamma" pots contain 90% gamma-isomer of hexachlorane.

To decontaminate warehouses in the south, the use of G-17 pots calculated for 2-3 g/m<sup>3</sup> and for 4-6 g/m<sup>3</sup> in the north is recommended. The "Gamma" pots consumed are calculated for 0.5-7 g/m<sup>3</sup> of space. Decontamination should be accomplished at an air temperature of less than 15°. Initially, the pots far removed from the entrance are ignited followed by those closer to the entrance.

When using an AG-UD-2 generator a 4% solution of technical hexachlorane in a diesel fuel calculated for 20 g liquid per cubic meter of warehouse space or a 13% solution of the same technical hexachlorane in green oil consumed at 15 g/m<sup>3</sup> is used. An AG-16 generator can be used instead of the AG-UD-2 generator. The new OPA-20 generator which is carried on a "Belarus" tractor and which has an output of 11 l/m is being industrially manufactured.

A generator nozzle is attached to the warehouse doors in such a fashion that the aerosols penetrate the pre-sealed space. After the aerosols have been triggered the doors are shut completely and the cracks sealed shut.

Aerosol containers can be purchased which contain dichlorovos (DDVF) and freon. When the valve located on the upper bottom of the container is depressed on a Kaplan turbine the freon ejects tiny drops of dichlorovos - aerosols. Small areas can be decontaminated using such containers. Dichlorovos works particularly well against flies, moths, grain flies, and other insects. In air it disperses rapidly into chemical products nontoxic to warm-blooded animals.

Usually technical DDT, and less frequently hexachlorane, is used as an aerosol since DDT disperses quickly and has a pungent, unpleasant odor. Technical DDT dissolves in diesel or solar

oil calculated for 8-10 kg of the substance per 100 liters of mass while hexachlorane does so in a proportion of 4 kg per 100 liters of oil.

Outdoors, aerosols can be most effectively used for the chemical protection of gardens and drought-protected forests. Aerosol generators are used to combat weeds in grain sown fields. These generators use 2.4-D ether or 2.4-D amine salts.

Experiments conducted in Kazakhstan disclosed that 1 kg amine salt per active substance dissolved in 15-20 liters of water or 2.4-D emulsifying ethers at a consumption rate of 0.3 kg for the active substance dissolved in 10-15 liters of water combats weeds in wheat, barley, and oats fields effectively.

Plant growths are treated with herbicides in the early morning hours and at night. Grains, as a rule, yield about 200-300 centners per hectare more harvest after this type of treatment.

The aerosol method is extremely efficient. By treating fields with them liquid consumption is reduced 10-15 times while spraying gardens, wooded regions, and other forested areas reduces consumption from 1-2 thousand liters per hectare to only 20-25 liters per hectare. Pesticides are even more economical.

Aerosol work must be conducted under the supervision of a soil conservation specialist and all safety measures must be taken into consideration.