

Recommendations for Using

DDT

RECEIVED

By W. A. Price

JUL 11 1947

EXPERIMENT STATION
LIBRARY

	Page		Page
Flies	3	Human Lice	5
Mosquitoes	3	Ants	6
Bedbugs	3	Clothes Moths and Carpet Beetles ..	6
Cockroaches	3	Stored Grain Pests	6
Silverfish	4	Garden Insects	7
Fleas	4	Flower Insects	7
Dog Ticks	4	Shade-Tree Pests	7
Sheep Ticks and Sheep Lice	4	Fruit Insects	7
Cattle Lice	5	Bees	8
Hog Lice	5	Cautions	8
Chicken Lice	5		

Circular 438

UNIVERSITY OF KENTUCKY

**College of Agriculture and Home Economics
Agricultural Extension Division**

Thomas P. Cooper, Dean and Director

COMMON DDT FORMULATIONS

DDT is not universally effective against all insects but is an excellent control for some of our common insect pests. It is generally found on the market now in four forms, as follows:

A dusting powder, containing 3 percent, 5 percent, or 10 percent DDT ready to apply dry and without dilution.

A wettable powder containing 50 percent DDT ready to be mixed with water and applied as a spray.

An emulsion containing 20 percent to 35 percent DDT ready to dilute with water and apply as a spray.

An oil, such as refined kerosene, ordinary kerosene, or light mineral oil, containing 5 percent DDT ready to apply to surfaces upon which insects rest or travel. This form is to be used on inanimate objects and never on plants or animals.

When used according to recommendations, these four formulations may be expected to give good results in the control of certain insects affecting plants, man, and animals.

FLIES

At the barn practice cleanliness and sanitation to control flies. Then spray surfaces where flies rest or crawl either inside or outside the barn with a 50 percent DDT wettable powder at the rate of $1\frac{1}{4}$ pounds to 3 gallons of water, or on a larger scale 21 pounds to 50 gallons of water.

In and around the house an oil (refined kerosene) solution containing 5 percent DDT or an emulsion diluted according to manufacturer's directions can be used to spray walls, ceilings, light cords, porches and other places where flies are found. Spray until the surface is wet but not until droplets begin to run. One or two applications on the inside of the building will be enough for the entire summer, while the outside of the building should be sprayed every three or four weeks during the fly season. Screens should be painted with the oil solution.

For flies on livestock use a spray of the 50-percent wettable DDT powder in water. For hornflies use $\frac{1}{2}$ pound of the 50-percent wettable powder in 3 gallons of water, or on a larger scale 8 pounds in

50 gallons of water. To kill stable flies, biting gnats, and some of the horse flies use 1¼ pounds of the powder to 3 gallons of water. Spray the back, belly, sides and legs using about one quart of the liquid on each animal. The first treatment should be made when flies become troublesome and subsequent treatments at 3-week or 4-week intervals. Often two or three treatments properly timed will give protection for the season.

The spray may be applied with a compressed air sprayer having a capacity of about 3 gallons, a bucket pump sprayer, a knapsack sprayer, a wheelbarrow sprayer, or an orchard sprayer. Regardless of the type of sprayer used, it is important to keep the liquid in the tank agitated while spraying. Don't use oil solutions on livestock.

MOSQUITOES

DDT oil solutions, emulsions, or suspensions applied to breeding places will give good control when used in 1-percent concentrations, at the rate of 5 quarts per acre. A 3-percent dust or a 1-percent wettable powder spray may be applied to shubbery and rank weed or other growth about the yard and garden to reduce the annoyance of mosquitoes, in the yard. In the house, mosquitoes can be controlled by the same sprays as those recommended for flies.

BEDBUGS

DDT is the answer to the bedbug problem. When applied as a 5-percent oil solution or emulsion or as a 10-percent dust to mattresses, beds, and chicken houses, these places should remain free of infestation for a period of 6 months or longer. When the solution or emulsion is used, about 3 liquid ounces of the spray is needed for each full-sized bed. This is enough material for a thorough treatment of the mattress, pillows, springs, and all parts of the bed frame. After treatment the bed should be allowed to dry for a few hours before it is made again. One and a half ounces of 10-percent DDT dust is enough for treating a full-sized bed. It is applied to the same locations as recommended for the spray. In infested rooms, spray or dust behind baseboard and other places where bedbugs hide.

COCKROACHES

Treat hiding places and areas where roaches travel with the 5-percent DDT oil solution or emulsion, or dust liberally all cracks and crevices with DDT 10-percent powder. Roaches travel and hide on

the under sides of such objects as refrigerators, table tops, and shelves. These places and similar ones should be sprayed along with the dust treatment. Chlordane is more effective than DDT against roaches.

SILVERFISH

Since most infestations of silverfish start in the attic or storage rooms, such places should be dusted liberally with a 10-percent DDT dust. Other places about the house where the pests are found should be dusted, or sprayed with the 5-percent DDT oil solution or the emulsion.

FLEAS

For fleas in the house apply 10-percent DDT powder to the sleeping places of dogs and cats and in holes and runways used by rats. The dust may be used beneath rugs, on floors, and on the ground near the sleeping quarters of the dog, cat, or other host animal. One pound of the dust will treat 1,000 square feet of ground or floor space. After treating the premises, give the dog an application of the dust. Use 1 or 2 tablespoonfuls on an average sized dog. Brush the dust gently into the hair with the hands. Don't use DDT on cats.

DOG TICKS

Control measures should be centered around the ticks on the dog and places where ticks usually hide. Dusting the dog with 10-percent DDT powder at the rate of 1 to 2 teaspoonfuls per animal, at 10-day intervals, during the summer, will keep it free of ticks. The same kind of dust can be used in treating the cracks and crevices about baseboards and the floor coverings, at the rate of 1 ounce to 1,000 square feet of area.

Ticks are active in spring and early summer. At that time an application of 10-percent DDT dust, at the rate of 10 to 15 pounds per acre should be made to grass, weeds, or shrubs in back yards, vacant lots and recreation grounds. One dusting early in the season is usually enough, but a second dusting may be made if ticks are later discovered in the area.

In areas where ticks are abundant, nightly inspections of adults, children and dogs should be made and ticks removed with tweezers, when found. This practice is in addition to the use of DDT dusts.

SHEEP TICKS AND SHEEP LICE

Sheep infested with lice or ticks should be treated with DDT either as a spray or as a dip. In either case the strength of the finished

material should be 0.2 percent DDT, made by adding 1 pound of 50-percent DDT wettable powder to 25 gallons of water. If spraying is undertaken the job should be thorough. A power sprayer, developing about 400 pounds pressure should be used and the spray nozzle should be held close to the wool and moved from side to side during the spraying operation. A single application is usually enough for the control of these pests.

CATTLE LICE

To avoid extensive winter treatments, treat all cattle during the last warm days in fall. Thoroughly wet down, to the hide, all parts of the animals with a spray containing 1 pound of 50-percent DDT powder in 25 gallons of water. A single treatment will usually destroy the lice. In some cases, however, a second treatment may be needed 2 weeks later.

For winter treatments use a dust containing 5 or 10 percent of DDT. Working the dust into the coat of the animal gives the best results. Since DDT will not destroy the nits, a second application 2 weeks later is recommended. About 2 ounces is enough for a single treatment of a mature horse or cow.

HOG LICE

Use the same treatment recommended for cattle lice. Sows should be treated before farrowing and boars before the breeding season so that lice are not transmitted to pigs or to sows.

CHICKEN LICE

Chickens can be freed of lice with a single treatment with 3-percent DDT dust. The material can be applied by the pinch method to the area about the vent; under the wings, and on the back and neck. Another treatment 2 or 3 months later may be necessary. The sodium fluoride and nicotine sulfate treatments are very effective against all species of lice on poultry. The drop method of applying nicotine sulphate is superior to the roost treatment.

HUMAN LICE

Body, head, and crab lice can be treated effectively with a 10-percent DDT dust. Apply the dust to the clothing for control of body lice, to the hair of the head for control of head lice, and to the pubic region and other hairy parts of the body for control of crab lice. Two treatments at 10-day intervals are recommended.

ANTS

For ants in buildings apply an oil spray containing 5 percent DDT. Spray behind and beneath baseboards, behind window sills and frames, about sinks in the kitchen, to both sides of pantry shelves and to any cracks and crevices leading to the outside of the building.

Anthills in the yard can be treated with fair success by dusting them liberally with 10-percent DDT powder. A much better remedy, however, will be found in the use of a concentrated pyrethrum (2 percent pyrethrins) and soap mixture, such as Red Arrow, Evergreen and Multicide. This material is used at the rate of 2 ounces to 10 gallons of water or on a smaller scale 1 tablespoonful to a gallon of water. Ten gallons will treat anthills 4 to 6 feet in diameter; 1 gallon will treat a hill 10 to 12 inches in diameter. After the concentrate is added to the water and stirred, it is poured rapidly over the anthill.

CLOTHES MOTHS AND CARPET BEETLES

Apply a spray solution (oil or emulsion), containing 5 percent DDT, to the walls and floors of clothes closets, to baseboards, to floors beneath rugs or carpets, and to any cracks or crevices where lint may collect. Make two thorough applications each year, one in June or July directed against the adults of these pests.

Unless washed or dry-cleaned afterward, woolen fabrics such as clothing, blankets and rugs, thoroughly sprayed with a 2-percent solution of DDT in refined kerosene, will be protected from attacks of clothes moths and carpet beetles for a period of several months. DDT sprays are not recommended for rayons.

STORED GRAIN PESTS

Seeds held in storage for planting purposes can be protected from attacks of stored grain insects by treating them with a 3-percent DDT dust containing pyrophyllite or magnesium oxide dust as the carrier. It should be used at the rate of $\frac{1}{2}$ ounce per bushel. In magnesium oxide 3-percent DDT is doubly effective on account of the repellent action of the oxide. Bags sprayed or dipped in DDT solution will give protection to grain contained therein against stored grain insects for a considerable period of time.

Bins and cribs for the storage of grain should be sprayed on the inside with 5-percent DDT in oil, just before the new crop is harvested.

GARDEN INSECTS

A 3- or 5-percent DDT dust with a carrier of pyrophyllite, talc, or suitable clay is recommended for use on potatoes, cabbage, onions, and tomatoes (not on small tomato plants) for the control of most insects affecting these plants, and on corn for the control of the European corn borer. (See Kentucky Circular 435, "How to Control Garden Insects," for more detailed instructions.) On account of injury to the plants, DDT is not recommended for use on melons, cucumbers, beans, and acorn squash. DDT like arsenate of lead is poisonous and should not be used on broccoli, cauliflower, lettuce, greens, or other leafy vegetables commonly used as food.

FLOWER INSECTS

DDT dusts (3 or 5 percent) or the wettable powder sprays (1 pound 50-percent DDT wettable powder in 50 gallons of water) are effective against many flower pests. The list, not yet completed, includes the following: Gladiolus thrips, rose midge, rose chafer, leaf rollers, rose slugs, tarnished and other plant bugs, blister beetles, leaf hoppers and Japanese beetles.

SHADE TREE PESTS

The common defoliating insects attacking shade trees can be controlled by spraying with DDT. Use 1 pound of 50-percent DDT wettable powder to 50 gallons of water. This spray will leave a white deposit. If this is objectionable, a dilute oil emulsion containing 0.1 percent DDT can be used. Wet the foliage until spray droplets begin to run. These sprays when properly applied will be effective against cankerworms, elm leaf beetles, May beetles, tent caterpillars, sawfly larvae, and webworms.

A 5-percent DDT emulsion applied to the trunk and larger limbs of locust trees shows promise of giving protection against the locust borer.

FRUIT INSECTS

DDT will kill many important orchard pests such as codling moth, oriental fruit moth, and leaf hoppers. It also kills beneficial parasites and predators, particularly those affecting the European red mite and the oriental fruit moth. For this and other reasons, fruit growers able to produce a reasonably clean crop of apples or peaches with other standard spray materials would be unwise, at this time, to change to the use of DDT. Growers unable to control codling moth

with lead arsenate will find a DDT-lead-arsenate-fixed nicotine spray schedule outlined in Kentucky Extension Circular 428.

Where oriental fruit moth is a serious problem on peaches, use 2 pounds of 50-percent wettable DDT powder and 6 pounds of wettable sulfur per 100 gallons of water. Apply 1 month before harvest and again 2 weeks later.

For grape leafhopper and other grape pests on foliage use 2 pounds of wettable DDT powder in 100 gallons of water.

BEES

Unwanted colonies of bees that have become established in the walls of the house or in similar places can be destroyed by blowing about 2 ounces of the 10 percent DDT dust into the entrance to the nest. Make the application at night when the bees are not flying. Use a small dust gun with a short piece of hose on the end of the dust spout. Insert the hose into the opening to the nest just far enough (3 or 4 inches) to reach through the outer wall and pump the dust into the open space. After the bees are killed the opening should be closed with calking or similar material.

CAUTIONS

DDT is not an acute or caustic poison but it should be handled with care, like any other poison. When large amounts of spraying or dusting are to be done, use gloves, goggles and a respirator to avoid excessive inhalation of material. Since oil solutions of DDT can be absorbed through the skin, avoid long exposure of the skin to oil solutions and emulsions. Wash the material from the skin with warm soapy water. Never use oil solutions on livestock. Do not use DDT on cats. Do not use inflammable oil solutions near fire.

When taken internally DDT is poisonous. Care should be exercised when applying this material. When making applications in the barn, cover feed troughs and water fountains with papers or empty feed bags. If such places are not covered they should be washed before they are again used by the animals. Do not put DDT on any plant material to be used within a few weeks as food by man or animal. Never put DDT on dry or stored food.

Lexington, Kentucky

Cooperative Extension Work in Agriculture and Home Economics: College of Agriculture and Home Economics, University of Kentucky, and the United States Department of Agriculture, cooperating. Thomas P. Cooper, *Director*. Issued in furtherance of the Acts of May 8 and June 30, 1914.

June, 1947

30M-6-47