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SUGGESTIONS FOR BARN AND CATTLE SPRAYING
FOR FLY CONTROL

by

H. E. Morrison, Don C. Mote, and W. B. Rasmussen

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Introduction

DDT has been widely publicized for control of flies in and about barns and livestock buildings. Many formulations of DDT have been advocated for this purpose. Some of the suggested formulations are conflicting and this has resulted in a certain amount of confusion to individuals desiring to initiate a fly control program.

The conflicting and confusing recommendations are not surprising because they represent research investigations from many sections of the country. The initial work on fly control with DDT was probably undertaken by the Bureau of Entomology and Plant Quarantine at Orlando, Florida, where a special group of scientists turned out a tremendous piece of work. Some time will be needed to evaluate this research but some of the problems in fly control are of general and specific interest.

Surfaces of Buildings

It has been suggested that a survey should be made of the kinds of building surfaces which are to be sprayed before any attempts are made to give recommendations for spraying. The length of time DDT will retain its effectiveness will vary with the surface to be sprayed and the formulation of DDT used. For example:

DDT dissolved in an organic solvent such as odorless kerosene and sprayed on unfinished wood surface will penetrate several hundredths of an inch into the wood. It is only surface deposit of DDT which has any value for fly control.

If the same material is sprayed over painted surfaces, the length of time DDT will remain effective will vary with the age of the paint. Paints which have dried for only a few months will not retain the effectiveness of DDT as long as paints which have hardened for a period of one year.

Likewise, the same DDT spray will not retain its effectiveness as long over whitewash as over paint. Whitewash formulas which contain salt seem to retain DDT effectiveness longer than formulas not containing salt.

Temperatures

Temperatures play a varied role with DDT and its action on flies. The fly season is longer in those sections of the country which have prolonged hot climates. Flies are killed more rapidly by DDT under low temperature conditions, but the reason for this is not clearly understood.

Both high temperature and high light intensity are credited with breaking down DDT. The effectiveness of DDT for fly control will probably be retained longer in climates of low to moderate temperature.

Formulations of DDT

There are many different DDT preparations now appearing on the market, but they can be generally classified as follows:

I. The solubilized DDT spray, or common fly spray, is a form in which technical grade DDT is dissolved in some organic solvent such as odorless kerosene. It is commonly used in either 5 or 10% strengths and can be so purchased from dealers.

This type of spray is useful for application in and about buildings where visible residues are undesirable. The solvent soon evaporates, leaving behind an unnoticeable residue of DDT.

This spray mixture is likely to be irritating to the operator and to livestock. The solvents alone are likely to produce from moderate to severe irritation, depending on the susceptibility of the individual. The same reactions are likely to occur on livestock and there are reports that excessive amounts may either cause injury or death to livestock.

II. The DDT oil emulsion is prepared similar to the solubilized spray, but an emulsifying agent is added, which makes it possible to dilute it with water and use it as an emulsion spray. This type of spray may leave an oily residue, depending on the kind of oil in the emulsion. It may be irritating to the operator and livestock and should be used with caution.

III. Wettable DDT, the Water Suspension DDT Mixture consists of DDT mixed with a dry diluent and is readily wettable when mixed with water. It may be purchased from dealers in percentages, varying from 10 to 50%. This type of spray will not be irritating to operators or livestock and is, therefore, favored for barn and livestock spraying. However, wettable DDT spray, after water has evaporated, will leave a white residue which may be unattractive and unsuited for household treatments.

The Amount of DDT to use in the Spray

The work carried on at Orlando, Florida, where temperatures are high and the fly season long, indicated that a deposit of 200 milligrams of DDT per square foot was necessary for fly control. Deposits lower than 200 milligrams made it necessary to spray more than once during the season.

It is believed that under Western Oregon conditions a deposit of 5 milligrams per square foot will be adequate for fly control. The warmer conditions of Eastern Oregon may make it necessary to have a deposit of 10 milligrams per square foot.

The above deposits can be obtained by thorough spraying, but runoff of the material should be avoided. One gallon of the spray should cover from 1700 to 1900 square feet.

For Western Oregon

Four pounds of 50% wettable DDT per 100 gallons of water (0.7 oz. per gal. water) or 8 pounds of 25% wettable DDT per 100 gallons (1.3 oz. per gal.) should give a deposit of about 5 milligrams per square foot for western Oregon conditions.

For Eastern Oregon

Eight pounds of 50% wettable DDT per 100 gallons of water (1.3 oz. per gal.) or 16 pounds of 25% wettable DDT per 100 gallons of water (2.6 oz. per gal.) should give a deposit of about 10 milligrams of DDT per square foot for eastern Oregon conditions. More definite recommendations will be made as soon as pertinent data can be collected.

Precautions

There are several suggested precautions which should be followed by farmers who undertake a fly control program. The effects of DDT when ingested by livestock in moderate amounts have not been fully ascertained. Excessive dosages may prove harmful. It is therefore suggested that feed should be covered or removed from feeding receptacles before spraying. These same receptacles should be cleaned again after spraying and before filling with food.

Cattle Spraying for Fly Control

The same formulation (4 pounds of 50% wettable DDT per 100 gallons of water) can also be used to spray livestock for horn fly, house fly, and louse control. Approximately 1/2 to 1 gallon of spray per animal is necessary. DDT has not been found effective against cattle grubs and there are conflicting reports of its effectiveness on ticks. Its action on deer fly, horse fly, stable fly, and other cattle pests is inconclusive.

Spray Machinery

Almost any type of spray apparatus may be used for barn spraying, but the efficiency of the operation will vary with the efficiency of the machinery. The 3-gallon knapsack sprayer will serve adequately for small buildings, but more efficient results can be expected from power machinery which is equipped with agitators and pumps capable of producing 200 or more pounds pressure.

Efficient cattle spraying can only be accomplished with power machinery. Spray guns should be equipped with No. 5 disks and two or three nozzle guns are preferred over single nozzle guns. Nozzles should be held from 1 to 2 feet from the animals in order to obtain thorough penetration of the spray.

Material Costs of Fly Control

It is difficult to give comparative costs of the various DDT formulations because of the existing fluctuations in prices. The following estimates are based on small package purchases and calculated on the basis of equal deposits of DDT (100 milligrams of DDT per square foot over an area of 1700 to 1900 square feet).

Approximate costs of a 5% solubilized DDT fly spray to give 100 milligrams of DDT per square foot over an area of 1700 to 1900 square feet.....	1.80
Approximate costs of 25% oil emulsion to give deposits as listed above.....	.72
Approximate costs of the 25% wettable powder to give deposits as listed above.....	.54
Approximate costs of the 50% wettable powder to give deposits as listed above.....	.40

When and Where to Spray

It is suggested that fly control should be started at the first appearance of flies in the spring. This will prevent build up of fly populations later in the season. There is little evidence that DDT will effectively control fly maggots in manure piles. In fact, it has been reported that manure will inactivate DDT. However, the spraying of areas about manure pits, exterior of barns and buildings will pay dividends in fly control. A great many flies are killed by contacting the sprayed surfaces before they can deposit fertile eggs.

DDT in Paints

The idea of mixing DDT in paint has aroused considerable interest. The idea has some merit for those buildings in need of paint. However, the effectiveness of the DDT is likely to vary with the kind of paint used. Water soluble paints will retain DDT effectiveness longer than oil paints. The limiting factor to applying DDT with paints is the labor cost involved in application. Spraying of surfaces will prove to be efficient and less costly than applying DDT on surfaces with a brush.

Aerosol Spraying

There are a number of different types of aerosol sprayers and aerosol applicators now in various stages of development. The Experiment Station has carried on preliminary trials with the Besler Aerosol Sprayer and the results have been very promising. There are indications that fly control can be accomplished by this unit with considerable savings of time and material. More complete information on this aerosol sprayer is presented in another Circular of Information.

In spite of all the complicating factors involved in the use of DDT sprays for fly control, there is sufficient evidence on hand to show that effective and practical fly control can be accomplished. By using normal precautions, farmers should effectively reduce the fly problem without expending large sums of money.

Dilution Tables for Wettable DDT Concentrate

Table 1. A 0.5% DDT formula which if applied at the rate of 1 gal. for 1900 square feet will give a deposit of 10 milligrams per square foot. This dilution may be advisable for eastern Oregon conditions.

Percent of DDT in wettable concentrate	Number of Pounds of Wettable DDT Concentrate to Use in the Following Amounts of Water				
	100 gal.	50 gal.	25 gal.	10 gal.	1 gal.
Purchased					
10	40	20	10	4	6.4 oz.
20	20	10	5	2	3.2 oz.
25	16	8	4	1-10 oz.	2.6 oz.
40	10	5	2-1/2	1	1.6 oz.
50	8	4	2	13 oz.	1.3 oz.

Table 2. A 0.25% DDT formula which if applied at the rate of 1 gal. for 1900 square feet will give a deposit of 5 milligrams per square foot. This dilution is believed to be satisfactory for western Oregon conditions.

Percent of DDT in wettable concentrate	Number of Pounds of Wettable DDT Concentrate to Use in the Following Amounts of Water				
	100 gal.	50 gal.	25 gal.	10 gal.	1 gal.
Purchased					
10	20	10	5	2	.1 oz.
20	10	5	2-1/2	1	1.6 oz.
25	8	4	2	13 oz.	1.3 oz.
40	5	2-1/2	1-1/4	8 oz.	0.8 oz.
50	4	2	1	7 oz.	0.7 oz.

Example--- Enter the above tables according to the percentage DDT in concentrate in the left-hand column. Follow this entry through to the right to the column, giving the desired number of gallons. The figure thus listed designates the amount of DDT powder to mix into this amount of water.