

TRIALS FOR MITES CONTROL IN LAYING POULTRY FLOCK

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Received: 8-12-2003.

Accepted: 12-1-2004.

SUMMARY

Common or red mites (*Dermanyssus gallinae*) cause a serious problem for poultry specially laying flocks. The manifestations of mites vary from a nuisance to death depending on the severity of infestation.

Trials were conducted to control mites in laying poultry flock by using insecticides on birds and in the farm. 5 insecticides were used for spraying of the farm and poultry. Dimethoate (1%), malathion (5%), diazinon 60 (0.1%), butox 50 (0.1%) and metriphionate (0.15%). The first two were used in half strength for bird spraying with other insecticides, and the last two were used for dipping of infested birds.

The results of this study indicated that the most effective insecticide as a building disinfestant was diazinon 60, which produced a complete reduc-

tion of mites at 12 hours post-treatment meanwhile butox 50 was effective in spraying and dipping of birds. It caused a reduction in mites infestation 100 % and 95 % within 20 hours, respectively. It is clear that dipping of birds in insecticide solution is better than spray.

INTRODUCTION

External parasites can cause real problems for poultry producers, these unwanted visitors can be brought into the poultry house by wild birds, roosting or nesting in the poultry house. Rodents had also been known to transfer them to poultry house. Also, the new birds being added to the flock can transfer them, so all new birds should be checked for parasites before they are mixed with the original flock.

Among parasites that can be found on birds, mites, lice, and sometimes chiggers are includ-

ed. The mites and lice are host specific and are not found on animals other than birds. There are several species of mites that may be found on poultry. This insect can be spread from farm to farm by infested crates, chickens or other birds. Common red mite (*Dermanyssus gallinae*) is a species that does not remain on the host all times. During the day, the mite finds refuge in cracks and crevices of nests, roosts, and other places in the poultry house. At night, the mite leaves their hiding places, and seek for the bird to take a blood meal, then return to its hiding places. So, red chicken mite is found only on birds at night. This makes its investigation more difficult. Mites can be easily spread from bird to bird and the number of insects on a single bird can be increased rapidly. The mites can live from several days to 3 weeks or a month detached from the host. Because of this fact, depopulation of a poultry house to get rid of mite problem should include a down time of at least one month (Berry, 1998).

The red mites of poultry are more difficult to be identified and treated because they are usually on the birds at night only. They are small and grey in color, but may appear red if they have filled with blood after feeding on the bird (Anon, 1998).

Mite infestation on poultry vary from a nuisance to death depending on the severity of infestation. The birds appear droopy and weak or they have pale combs and wattles and suffer from anaemia. These ectoparasites reduce the egg production of

laying hens and cause decreased feed intake and weight loss. The birds become susceptible to other parasites and diseases, also, mortality rate increases specially in heavy infestation (Williams, 2003).

From the available literatures, we can imagine the importance and the difficulty of mites disinfection. Early detection of mites by regular monitoring of the flock is the best method of control of mite infestation. Also, one of the most effective forms of control is through good management practices that focus on hygiene, vigilance and the provision of housing that does not encourage the proliferation of red mites. Building design is also a significant factor, as mites are known to breed profusely in the dark corners, cracks and crevices of old building, also the elimination of wild birds and others is so important (Anon, 1998).

One of the most effective methods of disinfection of mites in a poultry farms is the use of insecticides. This treatment may involve spraying insecticides and chemicals on birds, nests, roosts, cages, litter, or in the building. Nesting material should be removed and burnt or buried before application of insecticides. The treatment must be repeated at 7 to 10 days, two to three times, to break the life cycle of mite (Graham, 1989).

Many studies showed that on a number of poultry farms mites had not been controlled despite curative and preventive measures. The insecticide

used should be approved for poultry systems and not contaminate eggs and meat (Hoglund et al., 1995).

The mechanical cleaning of poultry houses has been shown to be efficient as spraying with metrifphonate in controlling mites. The replacement program using certified mite-free pullets have been recommended as alternatives to chemical control measures (Hoglund et al., 1996). Chirico and Tauson (2002) used 2 % metrifphonate to eliminate mites from laying poultry flock, they found that the reduction of mites recorded in 2 weeks trial was 99 %.

Berry (1998) reported the use of malathion and carbaryl (sevin), coumaphos and rabon in eradication of red mites in poultry. He added that these insecticides in addition to isolation and good sanitation programs controlled mite infestations in laying poultry flock.

Jeffery and Brigid (1999) mentioned that organophosphates, as malathion and dimethoate insecticides were used to eradicate mites in poultry flock and the insecticides were very effective in reduction of mites .

The use of insecticides and acaricides in controlling mites had been reported to be very effective. These chemicals include dimethoate, malathion

.metrifphonate , pyrethrins , butox and sevin (Maff, 1974; 1980 ; Maurer et al., 1993; Hoglund et al. 1995; Hinkle, 2003; and Williams, 2003) .

The present study was planned to screen of the suitable and efficient insecticide to eradicate mites in poultry flock.

MATERIALS AND METHOD

A private multi-tiered floor battery laying farm (capacity of 70000) in Samanoud city Gharbia province infested with red mites was examined and treated by insecticide applications from May to July, 2003 .The treatment included the birds (direct) and the house, battery, roosts and equipment (indirect).

Materials :

A-The following disinfestants with the corresponded recommended concentrations were used for spraying of poultry house as well as infested birds. Dimethoate (1 %), butox 50 (deltamethrine) , (0.1%) , diazinon 60 (0.1%) , malathion (5 %) and metrifphonate (0.15%) . Dimethoate and malathion were used in half strength for spraying of infested birds with other insecticides.

B- For dipping of birds in disinfestants solution, butox 50 (0.1%) and metrifphonate (0.15%) were used.

Methods:

A total of 70 mites infested layers were taken as a random sample from the farm. The birds were divided into a 7 equal groups , each of 10 birds . 5 groups were treated by using the selected insecticides as a spray, using sufficient pressure (100-125 psi) to penetrate the feathers . The other 2

groups were used for dipping in the chosen disinfectant solutions. Also, the building was sprayed using sufficient pressure with paying attention to cracks and fissures present. The results are recorded in tables (1 - 3).

RESULTS

Table (1): Effect of some disinfectants spray in poultry house on red mites:

Disinfectants	Hours post - treatment						
	1	2	4	8	12	16	20
Dimethoate (1 %)	20%	40%	65%	85%	95%	100%	
Butox 50 (0. 1%)	30%	40%	60%	85%	90%	95%	100%
Diazinon 60 (0. 1%)	35%	40%	70%	95%	100%		
Malathion (5 %)	25%	40%	65%	80%	95%	100%	
Metriphionate (0.15%)	15%	35%	60%	70%	80%	95%	100%

% = Reduction rate

Table (2): Effect of some disinfestants spray on red mites of birds.

Disinfestants	Hours post - treatment						
	1	2	4	8	12	16	20
Dimethoate (1 %)	5%	25%	35%	55%	65%	75%	80%
Butox 50 (0. 1%)	20%	40%	65%	75%	80%	90%	95%
Diazinon 60 (0. 1%)	15%	20%	45%	55%	60%	75%	80%
Malathion (5 %)	15%	25%	45%	55%	60%	70%	85%
Metriphonate (0.15%)	20%	35%	60%	70%	75%	85%	90%

% = Reduction rate

Table (3): Effect of dipping in disinfestant solutions on red mites:

Disinfestants	Hours post - treatment						
	1	2	4	8	12	16	20
Butox 50 (0. 1%)	25%	35%	60%	75%	100%		
Metriphonate (0.15%)	20%	35%	60%	70%	85%	100%	

% = Reduction rate

DISCUSSION

Mites cause serious problems to poultry industry, specially laying flocks. Their manifestations vary from a nuisance to death, depending on anaemia severity of infestation. There was a weight loss and anaemia, also, a drop of egg production. The infested birds become susceptible to other parasites and to diseases.

Many trials were made to eradicate mites in poultry specially layers, one of the most effective methods is the use of insecticides application in addition to good management practices that depend on hygiene, vigilance and provision of housing which prevent the proliferation of red mites. This treatment involves spraying insecticides and chemicals on birds, nests, roosts, cages, or in the building. The death rates of mites were recorded at different times after disinfestation of birds (by spray or dipping) and the poultry farm (by spray).

Results in table (1) showed the effects of disinfestants spray in poultry house on red mites. From the results, diazinon showed the highest reduction rate of mites at 8 hours post-treatment (95 %), followed by dimethoate and butox (85 %), then malathion (80 %), and lastly metriphionate which showed the lowest reduction rate at the same time (70 %).

Also, results in the same table (1) showed that the

most effective insecticide as a poultry farm disinfestant was diazinon which caused complete reduction of mites at 12 hours post-treatment followed by dimethoate and malathion at 16 hours, then butox and metriphionate which showed the same results at 20 hours after disinfestation .

From the previous data, it is clear that all disinfestants were effective in the treatment of poultry farm infested with red mites, but the best insecticide was diazinon, which showed the early results at 12 hours after spraying of building. The lowest ones were butox 50 and metriphionate, they caused 100 % reduction of mites at 20 hours after treatment.

These results were in agreement with that obtained by Maff (1974, 1980, (Maurer et al.) 1993), Nordenfors and Hoglund (2000) and Hinkle (2003). (Berry (1998). The disinfestation of mites on birds should be go hand in hand with poultry house treatment, in addition to curative and preventive measures (Hoglund et al., 1995 and 1996).

Arthur and Daniel (2003) mentioned that different insecticides as malathion ,dimethoate ,sevin , diazinon and butox spray of poultry houses were effective in erraication of mites . He added that the other preventive measures should not be neglected.

Results in table (2) demonstrated the effects of spraying of birds with insecticides, it showed that butox 50 was the most effective disinfestant used. Butox showed 75%, 80%, 90%, and 95% reduction of mites at 8, 12, 16, and 20 hours post-treatment respectively followed by metriphionate which produced 70%, 75%, 85% and 90% reduction of red mites, then malathion which showed 55%, 60%, 75% and 80% reduction rates at the same time after disinfestation. The lowest insecticides were dimethoate and diazinon, which showed lower reduction rates at the same periods of time.

Also, from the obtained results in table (2) it is clear that all disinfestants were effective in disinfestation of red mites on birds by spray, but no one produced complete reduction of mites at the end of 20 hours after treatment, the fact which indicates the need for a second treatment of birds after 7 - 10 days.

Concerning the effect of bird dipping in disinfestant solutions (butox 50 and metriphionate) on red mites, results in table (3), showed that complete death of mites was obtained at 12 hours in case of butox while the destruction of it by metriphionate was 100% at 16 hours after dipping. From the obtained data, it is clear that dipping of infested birds in disinfestant solutions is more potent than spray.

These findings agree with that mentioned by Kirkwood (1974); Maff (1980); Maurer et al. (1993); Hoglund et al. (1996); Anon (1998); Jeffrey and Brigid (1999); Nordenfors and Hoglund (2000); Arthur and Daniel (2002); Hinkle (2003) and Williams (2003). Graham (1989) mentioned that the insecticides applications produced good results in the reduction of mites either on birds or in the building and the treatment must be repeated at 7 to 10 days, two or three times, to break up the life cycle of mites. Chirico and Tauson (2002) used 2% metriphionate disinfestant for eradication of mites in two types of multi-tiered floor systems for layers. The treatment involved 2-week and 8-week trials. A 95% reduction of mites was recorded in the 8-week trial whereas a 99% reduction of mites was recorded in the 2-week trial.

Chemical controls for treating houses, nests, roosts, etc and birds include malathion, butox, diazinon, dimethoate, metriphionate, sevin, rabon and others are available. If red mites are suspected, careful treatment of cracks and cervices is a must and a repeat treatment is necessary at 7 to 10 days. For all chemicals used for poultry, the label directions for mixing, application, and precautions should always be carefully followed. The used chemical insecticides should be not toxic to birds and not contaminate their products (Nordenfors, 2003).

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