

TITLE:

Evaluation of DERGALL for the Control of the red poultry mite
(*Dermanyssus gallinae*) in battery cage housing system

PROJECT Code:

2015-07-Dergall

SPONSOR:

ICB Pharma

TESTING FACILITY:

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STUDY COMPLETION DATE:

3 September 2015

Project Title: Evaluation of DERGALL for the control of the red poultry mite (*Dermanyssus gallinae*).

OBJECTIVES

To conduct field trial to evaluate DERGALL for the control of the red poultry mite (*Dermanyssus gallinae*). To report the results in a report form suitable for direct presentation to research, regulatory and marketing personnel.

STUDY OUTLINE

The specific objectives of this study were:

- a. To determine the immobilization effect of Dergall on red poultry mite when mixed at the recommended rate of 60 ml of Dergall per 1 liter of water in battery cage housing system.
- b. To compare the efficacy of Dergall with untreated control.
- c. To determine if Dergall provides prolonged efficacy protecting hens from re-infestation by the red poultry mite.

Introduction: This study was designed and implemented to demonstrate the efficacy of Dergall against red poultry mite in battery cage housing.

Study Initiation Date: 5 August 2015

Experimental Start Date: 9 August 2015

Study Completion Date: 3 September 2015

Experimental design

There were two trials at commercial layer houses on the same farm naturally infested with red poultry mite with a cage system included in the study.

Each treatment area was evaluated red poultry mite population using the protocol outlined in 'Evaluation Procedures'. After the initial monitoring procedure, all housing elements that are typical hiding places, where mites aggregate need to be sprayed thoroughly from the top areas of the house and then downwards (surfaces directly surrounding the birds, i.e. cage wires, ancillary equipment, metal posts, feed troughs, conveyor belts, laying nests).

The control treatment with water only has been applied using the same procedure in separate layer house on the same farm.

24 hours and 5 days after treatment (5 DAT), the treated area was evaluated by monitoring for red poultry mite population. The same procedure took place 10 days after treatment (10 DAT) and 3 weeks later.

Initial treatment and subsequent treatment occurred on 9 August 2015 and 13 August 2015 respectively.

Test Substance: Dergall - poison-free formulation providing physical action through immobilization.

Control Substance: Water

Test Insects/Arthropods:

Test species: red poultry mite (*Dermanyssus gallinae*)

Location of Trials

Ostrów Wielkopolski, Poland

Housing method:

battery cage housing

Treatments:

Dergall prepared at the concentration of 0.6% (60 ml per 1 liter of water) and applied at the rate of 50ml/m² with mechanical compression sprayer at normal pressure from a distance of approximately 50 cm.

Two initial applications were performed on the first night. The second was made about 2 hours after the first application after observing the movement of many red mites.

The subsequent application has been applied following the same procedure (as a double treatment) 5 days following initial application.

Control treatment has been applied using water only at the rate of 50ml/m².

'Evaluation Procedures'

Mite Sampling and Laboratory Examination

The presence of the *Dermanyssus gallinae* from clusters of organic origin was assessed under light. Parasites in the poultry houses were determined prior and post-treatment by inspection of their likely hiding and breeding place and samples randomly taken from each of ten points from throughout both of the testing sites. Using a small surgical spoon, mites were collected by scrapings from the nest structures (incl. wooden threshold elements), feeding and drinking bowls, doors, hinges, crevices of hall walls, belt conveyor of eggs etc., and put into plastic containers.

Samples (10 g) of scraped litter were collected. Mites were taken out from the litter and investigated after 2 hours. The numbers of found alive mites were recalculated to one gram of scraped organic material to facilitate the comparison of effect of the tested preparation in the experimental and control objects.

Efficacy

Efficacy assessments post-treatment was conducted at 1, 5, 10 and 30 days. Mites has been assessed as active or immobilized at each assessment. 'Immobilized' refers to a state of no movement at all, and 'Active' is used to describe mites with full movement.

Bird's condition

The condition of hens will be monitored and assessed at each assessment time for possible negative/positive reactions. Health condition, feeding improvement, growth and egg production were also assessed.

Analysis of data

Table 2 shows the mite score assigned each monitoring points within each treatment both pre- and post-treatment.

Results & Discussion

As shown in Table 1 and 2, Dergall resulted in lowered mite scores in post-treatment counts at 24-hour, 5 (re-treatment), 10 and 30 days. It should be noted that the second application same night was made after observing the movement of many fed red mites moving back from the host where were during first treatment. This is an important procedure to disrupt the development of the population. This has been proven at the subsequent treatment 5 days later, where only proto-nymph stage was seen. This is a reason why 2 treatments a night as well as a follow-up treatment, 5 days after the first, are recommended. No efficacy was observed in the control population.

Conclusions

Dergall demonstrated a high level of efficacy, 24-hour, 5 days (re-treatment), 10 and 30 days post-application when prepared at the concentration of 0.6% (60 ml per 1 liter of water) and applied at the rate of 50ml/m². There were no observable negative impacts to the equipment, facilities, chickens, or applicators noted during this study. Average 10 days following the treatment a noticeable improvement in health condition of birds, feeding, growth and egg production were observed.

Table 1. *Dermanyssus gallinae* population assessment.

Treatment	Pretreatment Average	24 Hour Average	5 DAT Average	10 DAT Average	30 DAT Average
Dergall	0	79.5	83.0	92.0	73.0
Control	0	0	0	0	0

Table 2. Efficacy (percentage of mortality) against red poultry mite (*Dermanyssus gallinae*) in battery cage housing system.

Percentage by weight	Monitoring point no.	Initial treatment	24 hours After treatment	5 DAT Subsequent treatment	10 DAT	30 DAT
0.6	1	0	80	85	90	80
0.6	2	0	60	70	90	70
0.6	3	0	80	85	100	70
0.6	4	0	90	80	100	80
0.6	5	0	75	90	90	75
0.6	6	0	80	75	80	65
0.6	7	0	80	85	90	70
0.6	8	0	75	80	85	70
0.6	9	0	90	90	95	70
0.6	10	0	85	90	100	80

Figure 1. Pretreatment



Figure 2. Pretreatment

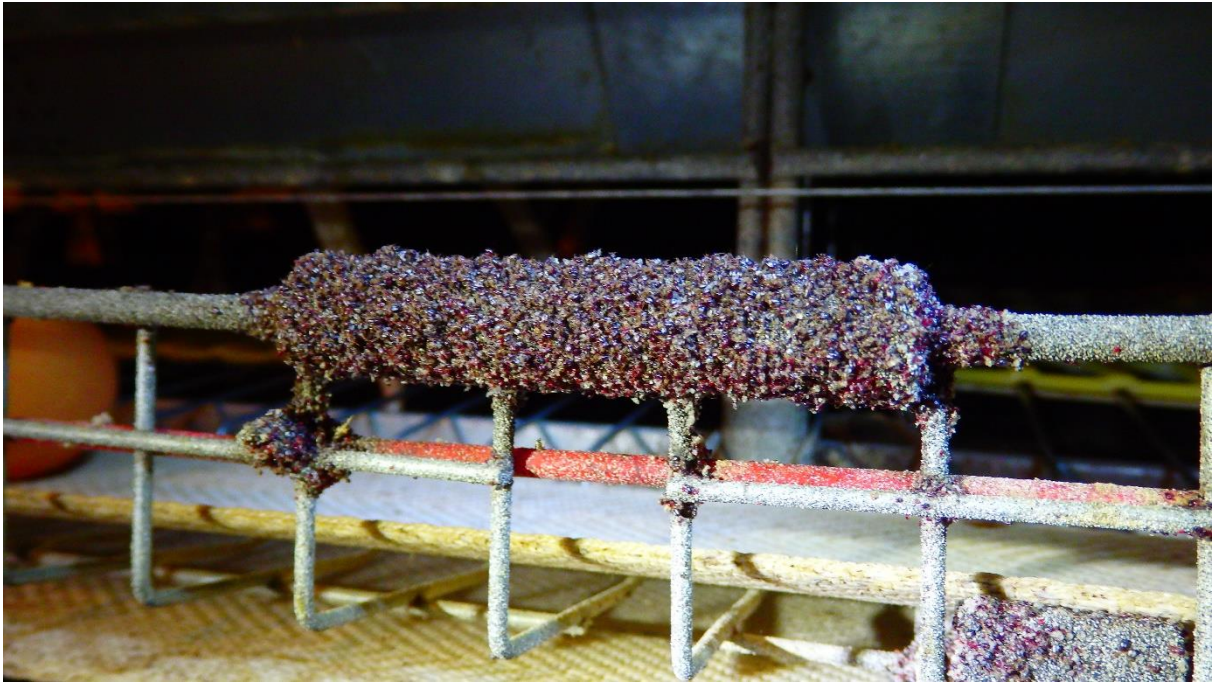


Figure 3. Pretreatment



Figure 4. Pretreatment



Figure 5. Material collected from monitoring point.



Figure 6. Pretreatment



Figure 7. Pretreatment



Figure 8. Sprayer used to apply treatment.



Figure 9. One of the nozzles used to apply treatment.



Figure 10. Treatment



Figure 11. Post-treatment - Immobilized mites



Figure 12. Post-treatment - Immobilized mites

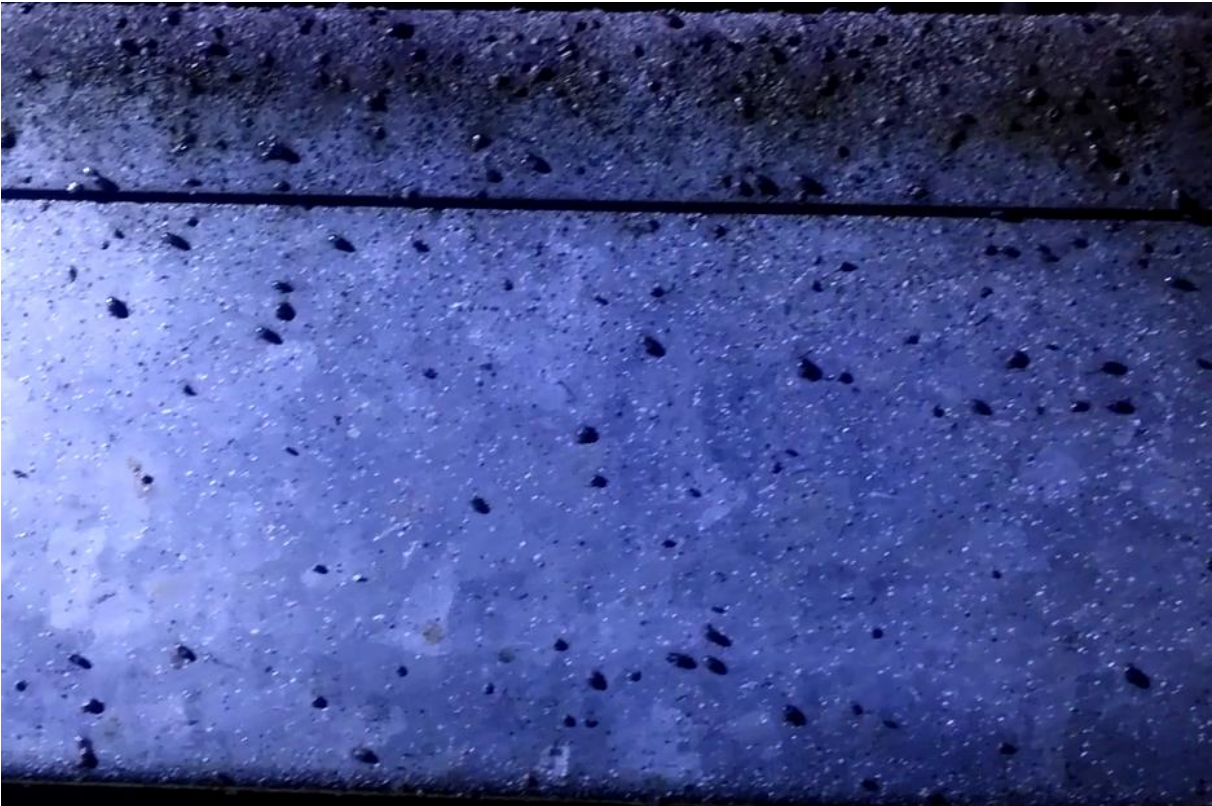


Figure 13. Post-treatment – visible reduction o mites



ADMINISTRATIVE DETAILS

Samples and Materials

Appropriate samples of the experimental product has been supplied by ICB Pharma. A Material Safety Data Sheet or equivalent information on the toxicology and handling requirements of all candidate compounds have been supplied to test provider by ICB Pharma along with the samples of the compounds.

Reporting

This final report contains full experimental details, results and photographs (if relevant) of the trials. It makes a scientific conclusions based on the data obtained that may be used as recommendations for future work or marketing possibilities.

-----END OF REPORT-----