

Innovative approach to tackle red mite infestation in layer farms

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Red mite is one of the most important external parasites that affects laying hens on farms around the world. More than 50% of layers encounter red mite problems.

Poultry red mite, or *Dermanyssus gallinae*, is a nocturnal blood feeding ectoparasite. It is a parasite that requires blood from its poultry host for its development and reproduction to occur.

It is particular problem on laying farms because of the duration of the production cycles. Red mites parasitise the hens for brief periods of time during the night when they take their blood meals.

The rest of the time they hide in dark places in the poultry house, such as cracks and crevices in the fabric of the building or in equipment such as egg belts, feeders, cages, perches, nests or under droppings or piles of feathers.

Effects on layers

Each parasite consumes 0.2µl of blood in each bite. As a consequence, anaemia can appear in hens that have a massive infestation of red mites, leading to depressed per-



Hens with anaemia due to red mite infestation (note the pale comb).

formance (weight loss, reduced feather quality and laying rate can be reduced by up to 25%). Mortality can occur due to debilitation and exhaustion and/or reduced immunity favouring *Escherichia coli* problems.

Stress behaviour, such as a higher level of preening, head scratching and feather pecking has also been reported in red mite infestations and in extreme cases this can lead to cannibalism and mortal wounds.

In addition, red mites have been implicated in the transfer of pathogens such as Marek's

disease virus, Newcastle disease virus and zoonotic bacteria such as salmonella.

Finally, the rate of downgraded eggs due to bloodspots from crushed mites on the eggshell can be high and up to 20% in cases of high infestation.

All this results in red mites reducing the profitability of laying farms. The global impact is difficult to evaluate and is probably underestimated by producers.

However, Mul (2009) has recently estimated an annual loss of €11 million in the Dutch layer sector alone, thus accounting for at least €0.3 per hen and per year.

This does not include the effect of red mites on farm staff, such as skin irritation and itching, dermatitis and allergies, that can result in lost man hours.

Increasing problems?

As red mites are highly adaptable to their environment, due to their very short reproductive cycle, resistance to insecticides that are used for its control is now emerging.

Evolution of welfare regulations such as the banning of lighting programs that were once used to control red mite and European directives on insecticide residues in eggs (MRL) are limiting the treatments available

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Table 1. Individual results per farm.

Farm	Dose (kg/T feed)	Duration (days)	Type	Number of layers	No. of red mite/trap before treatment	No. of red mite/trap after treatment	Reduction of red mite population (%)
F56-1	4	20	Cage	40,000	1183	177	85
F26-2	4	20	Free range	3000	1153	136	88
F26-3	4	10	Free range	9000	856	126	85
F26-4	2	20	Free range	9000	952	133	86
F26-5	2	10	Free range	23,000	739	121	83
F26-6	4	20	Free range	6000	908	126	86
F26-7	2	20	Free range	8000	879	131	85
F26-8	2	10	Free range	25,000	1388	235	83
F56-9	2	10	Cage	40,000	1570	251	84
F56-10	2	10	Cage	120,000	790	228	71
F71-11	4	20	Cage	100,000	351	104	70
F71-12	2	20	Cage	100,000	231	64	72
F56-13	2	10	Cage	120,000	1159	386	66
F56-14	4	20	Cage	32,900	211	43	79

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to the farmer during the flock's laying period and this is making it more and more difficult to control this nocturnal parasite.

Alternative solutions have been developed such as spraying natural insecticides in the houses, or by blowing inert dust on the hens to destroy the cuticle of red mite, thereby leading to its death by dehydration.

However, these techniques are time consuming, require special equipment and protection for the workers and their efficiency is really dependent on how carefully they have been applied.

Innovative solution

To cope with these disadvantages and to provide farmers with an easy to handle solution that can be used during the production cycle, a solution based on an in-feed patented non-medicated mixture of aromatic extracts known as Paralice has been evaluated in a large scale field trial involving several French laying farms that had encountered red mite problems.

Some 14 French laying farms representing a total of 650,000 hens that had poultry red mite were selected (seven cage farms and seven free range ones).

The red mite population in the buildings was evaluated before and after the inclusion of Paralice in the feed of laying hens.

In order to evaluate the red mite population of the buildings mite traps made of a double folded cardboard, kept closed by two staples, were built. These provided dark and narrow spaces that the red mites could use as shelters after their blood meal.

The traps were hidden underneath the feeders at different locations in the houses two days before giving the treated feed to the layers, to determine the initial infestation level of the house before the treatment.

Then they were used the fourth day after the end of the administration of Paralice in the same places as they had been in before. The number of red mites in each trap was counted using a binocular microscope.

Effect evaluated

The feed additive being evaluated, Paralice, was incorporated in the layer feed between 2 and 4kg per ton of complete feed, depending on the initial infestation level in the farm. The Paralice supplemented feed was fed to the layers for 10-20 days.

The effect of the treatment was evaluated by calculating the reduction of the population of red mites found in the traps after the treatment and recording this as a percentage of the population found before the treatment (initial population).

The results from the 14 farms are summarised in Table 1.

Results of the 14 tests showed a reduction in the red mite population after using Paralice in the layer feed that varied

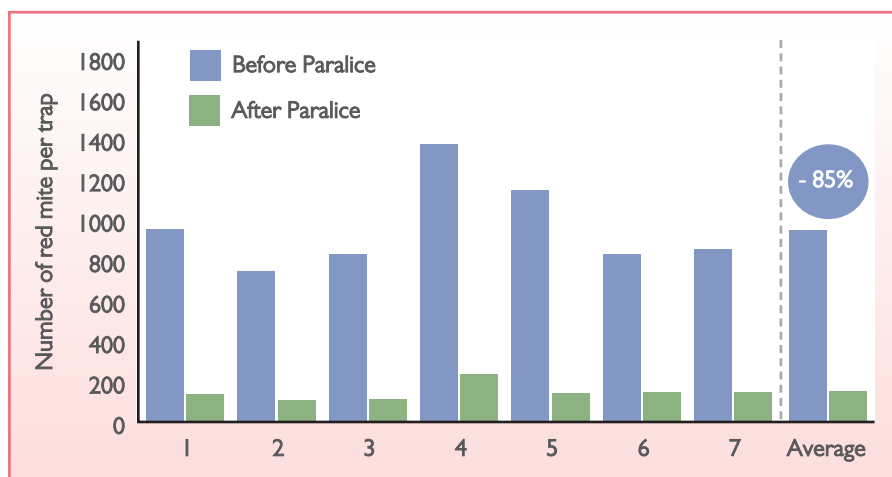


Fig. 1. Evolution of red mite population with Paralice – Floor.

between 67 and 88% of the initial population. On average, the reduction of the red mite population was 80.4%.

Farmer observations

Some interesting comments on the use of the product were also collected from the farmers.

They all confirmed a very positive general feeling after they started using Paralice. Their hens appeared to be quieter and the general atmosphere of the house seemed better.

They particularly appreciated the easy use of the product as it was introduced into the feed by the feed manufacturer together with the premix. Home-mixing farmers also found it easier to incorporate the product in their mixer than to spray a liquid product on material.

They also noticed a better resistance of the hens to high temperature as some trials were undertaken during the hot summer months. They especially reported a better feed consumption in the houses receiving the product in comparison with non-treated houses and a lower mortality during hot periods.

This last point, which remains to be validated by performances figures, could be explained by an increase of the red mite population in the non-treated houses, generating discomfort in the layers, while the level of infestation in the Paralice treated houses remained low.

Finally, farmers did not notice any adverse effect of the inclusion of the Paralice, even at 4 kg/T, on the feed palatability and intake.

Conclusion

This large scale field study has validated Paralice as a new non-medicated alternative approach to efficiently manage red mite infestation in layer farms even during the production period.

Paralice has an advantage in that it is easy to use as it can be included in feed (15 days treatment approximately 3-4 times per year).

Paralice can be used preventively starting with the arrival of a new flock to keep red mite levels below the level that generates economic losses and personal discomfort for the farmer.

With red mites, prevention is always the best economical choice! ■

Fig. 2. Evolution of red mite with Paralice – Cages.

