

Sustainable control and treatment of poultry red mites



INNOVATION



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This practical guide provides an overview of methods for the prevention, control and treatment of poultry red mite in laying hen houses according to an Integrated Pest Management (IPM) approach. IPM is a widely used, sustainable method for controlling pest species in horticulture and also offers a long-term solution for the effective and sustainable control of red mite. Here we describe 5 steps that are crucial in an IPM approach for the control of red mites (Figure 1) which enable the prevention and non-chemical control of the pest species whilst using chemical pesticides only as last resort to avoid the emergence of resistance. This guide focuses on methods for the prevention and suppression of red mite and the application of non-chemical control methods.

Step 1: Prevention & suppression

Biosecurity measures

The first step is to prevent the introduction and dispersal of red mite throughout the laying hen facilities. Red mites may be dispersed through people in addition to inert material such as poultry equipment. Wild birds do not seem to play any role in the dispersal of red mite within domestic poultry.

Figure 1: five steps of integrated pest management

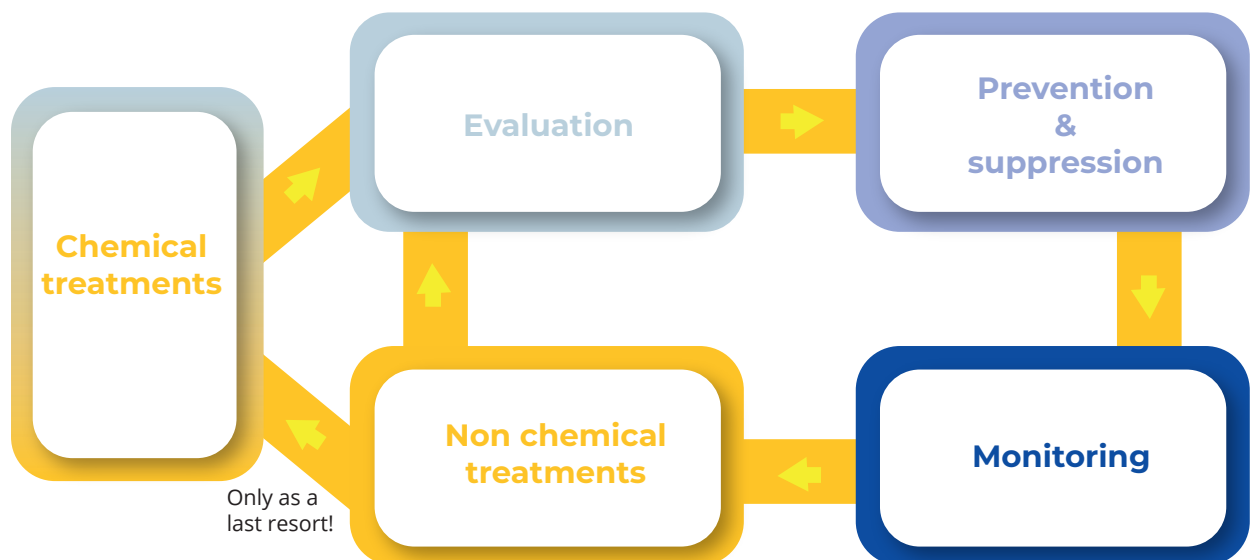


Figure 2: Biosecurity pictogram

The main preventative actions include:

- Staff and visitors** – Strict biosecurity measures such as limiting the number of people who enter each house, having separate equipment and tools for each hen house and correctly employing hygiene barriers all reduce the risk of mite transfer. The walking route should be from red mite free houses to houses with red mite.
- Pullets** – Mites can be introduced through the delivery of pullets. Pullet rearers should monitor and control red mite in their facilities. Crates should be cleaned and disinfected before pullets are loaded. Check the crates for red mite just before entering and inform your pullet rearer if mites are found.



Figure 3: Red mites on manure

- **Tip!** Turning lights on before catching places reducing the risk that they are on the pullets when caught.
- **Egg trays** – When delivered to the farm, egg trays need to be clean and mite free. If dirty, they need to be returned immediately.

If red mites are present in the poultry house, suppressive measures must be implemented to keep mite numbers under control. The most important suppressive action which can be taken is thorough cleaning of the poultry house and equipment between production cycles.

Cleaning between production cycles

It is very important to start a production cycle with the lowest red mite population possible. This is achievable with a thorough wet cleaning of the hen house during the empty period in between production cycles. Please note that extending the duration of the empty period cannot replace wet cleaning as a control measure since mites can survive up to 9 months without feeding. The following steps detail actions for thorough cleaning:

- **Remove manure** including all clustered manure residues (by scraping) on poultry equipment and housing (e.g. on feed track covers, perches and slats) (Figure 3)
- **Dry clean** the house:
 - ▶ with a broom to remove all detritus and dirt
 - ▶ with an air compressor to remove dust in inaccessible areas (Figure 4) such as motors (feed track, manure belt), tubing, around cable ties and inside heat exchangers if you have an in-house poultry manure drying system (professional cleaning companies can assist with this)
 - ▶ Dry clean the hen house for a second time

Figure 4: Examples of areas that require thorough cleaning such as manure belt aeration system, motors, tubing, joints, support structures, cable tie





Figure 5: Wet cleaning of aviary housing system



Figure 6: Hard manure crusts need to be removed

- **Wet clean** the house (Figure 5), equipment and wintergarden with high pressure, preferably hot water) and soap/detergent. Make sure the inside of ventilation ducts, manure belts and egg belts are cleaned thoroughly. **Let everything dry and disinfect afterwards**

In addition to the above mentioned cleaning steps, treatments can also be applied on the entire hen house in between production cycles:

- Silica is available both in natural (i.e. diatomaceous earth) or synthetic form and can be used as a dry or wet application depending on the supplier's recommendations.
- Temperatures above 45°C are lethal for red mite. By heating up the poultry house gradually to over 45°C for at least 2 days mites can be killed. Heat treatment is very expensive however and care should be taken that to ensure the housing system and equipment is able to withstand the high temperatures.

Suppressive measures during lay

Specific management actions during lay can prevent the introduction of red mites into the hen house and/or reduce their blood meal the growth of mite populations. These include:

- **Biosecurity measures:** Continue to follow these to avoid bringing mites into the hen houses as detailed above
- **Removing red mite hiding places including:**
 - ▶ Hard crusts of manure – these should be

scraped from the house at least monthly (Figure 6)

- ▶ Dust accumulations – these are more of an issue in aviary and cage systems and should be removed at least monthly
- ▶ Egg debris on egg belts – egg belts should be cleaned at least monthly
- ▶ Manure on manure belts – for houses with manure belts manure should be removed regularly (at least twice a week)

Tip! In order to prevent mites from walking back from the manure storage into the hen house, silica can be used to form a barrier (Figure 7)

Figure 7: Silica can be sprayed after removal of manure to prevent mites from re-entering the hen house



- **Using preventative non-chemical treatments** like predatory mites or feed additives. Since each hen house is specific, seek professional advice from the advisor/veterinarian/product supplier to discuss appropriate course of treatment

Step 2: Monitoring

A monitoring method should be applied to track the growth of the mite population in your hen house and inform the need for additional suppressive measures or treatments.

We have prepared another have guide on monitoring red mites, "How to carry out monitoring for poultry red mite in layer houses" and some short instructional guides on specific monitoring methods. These guidelines can be found on the MiteControl project webpage.

Step 3: Non-chemical products and actions

Actions to take when mites appear

When you first see mites in your house you should take the following actions:

- **Increase your surveillance of red mites:** check for mites in typical hiding spaces (see "Biology and life cycle of poultry red mite"), increase your monitoring frequency and try to identify the outbreak area in the hen house if possible.
- **Carry out the prevention and suppressive measures** listed above thoroughly
- **Apply control and treatment products** to local, red mite 'hot spot' areas in the house. The following measures are **only effective for low mite populations:**

Figure 8: Cleaning perches and structures by spraying soap



- ▶ Clean the outbreak area with water and soap
Tip! Ensure that the soap used is non-tainting and apply in a way to ensure the birds do not eat it (Figure 8).
- ▶ Silica or diatomaceous earth-based products can be used as well
Tip! Handheld sprayers are available for small, local applications.

Actions to take when the red mite population rises

- If you are using a preventative treatment:
- Contact your supplier to **seek advice** and review the course of treatment.
- Evaluate the change by **monitoring** and visually assessing the presence of mites (difference before/after the treatment).
- **If the preventative treatment used does not control the red mite population, use another treatment.**
- Silica treatment:
 - ▶ **Check** with the product supplier for the **procedure** to apply the product.
 - ▶ A silica application **during the production cycle** can greatly reduce red mite numbers providing that it is applied to **the entire house**. Treating only part of the house or splitting the treatment across several applications over several weeks will limit the effectiveness of the treatment.
 - ▶ To ensure the best possible reduction in mite numbers it is best practice to treat the whole house a **second time**, seven days after the first application to kill any mites that have **hatched from eggs** that were protected from the first application.

Step 4: Chemical treatments

Only a very limited amount of synthetic acaricides can be used because of health and food safety regulations. Moreover, resistance against acaricides has been found to reduce their efficacy.

Chemical treatments should always be used

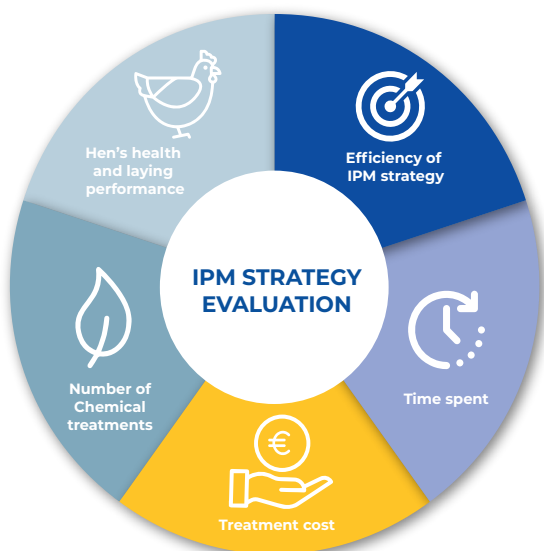


Figure 9: Indicators to take into account for the evaluation of the IPM strategy

cautiously and only as a last resort in cases where despite all former actions, either:

- ▶ the mite infestation has become too high
- ▶ the mite infestation remains high for too long
- ▶ too many applications of non-chemical treatments were necessary
- ▶ mite populations rise very quickly between two treatment applications
- ▶ any other cases that compromise hen welfare, health and/or production parameters

When chemical products are used it is important to:

- Carefully select the chemical acaricides (including veterinary medical products such as fluralaner) in consultation with your veterinarian
- Respect the advised dosage to protect and prevent the emergence of resistance and optimise the chances of success of the treatment.
- Check the health state of your flock with your veterinarian

Step 5: Evaluation

To assess the efficacy of the measures applied for the control of red mites and to determine whether adaptations are necessary, all steps within the strategy should be evaluated continually. Figure 9 illustrates the elements that need to be considered.

Once the evaluation is done, you can improve your strategy and for example apply other non-chemical preventative or treatment products in case some measures were less effective, too time-consuming or expensive. You can always consult your veterinarian or advisor to help you develop or adapt your control strategy.

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MiteControl project



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