## Module 6: Control Methods for Rodent Pests

**Duration: 20 minutes**

**Overview:**

Rodent control is a critical component of integrated pest management (IPM) on farms and in storage facilities. In this module, we explore the most effective control methods for managing rodent populations, focusing on physical, chemical, and biological strategies. The key objective is to develop a balanced approach to rodent control that minimizes harm to non-target species, the environment, and human health, while effectively preventing and managing rodent infestations.

By the end of this module, learners will understand the various control methods available for rodent pests, including exclusion techniques, trapping, and the judicious use of rodenticides. Students will also gain insight into when and how these methods should be used in combination to achieve long-term rodent management.

**Key Topics:**

- **Physical Control**
  Physical control methods are the first line of defense against rodent infestations. These methods aim to prevent rodents from accessing or living in critical areas like storage facilities or crop fields. By eliminating easy entry points, farmers can greatly reduce the likelihood of an infestation.
    - **Exclusion:**
      Exclusion is one of the most effective ways to prevent rodent infestations in buildings and storage facilities. This method involves sealing any gaps, holes, or cracks where rodents could enter. Since rodents are excellent at squeezing through small openings, it is crucial to thoroughly inspect the facility and seal potential entry points.
        - **Sealing Gaps and Cracks**: Use materials like steel wool, caulk, or metal mesh to fill holes in walls, floors, and ceilings. For larger openings, steel plates or hardware cloth may be needed. Rodent block expanding foam is another great option.

        - **Door Sweeps and Seals**: Install door sweeps or weather stripping on doors and windows to prevent rodents from entering through gaps. This is especially important for facilities with frequently opened doors, such as barns or warehouses.
        - **Ventilation Openings**: Ensure that vents, chimneys, and air ducts are properly screened. Rodents can easily enter through ventilation systems,

so fine mesh or other durable materials should be used to block their access.
        - **Screens and Barriers**: Screens can be placed over vents or openings to keep rodents out. When installed properly, they act as an effective barrier without restricting airflow.
    - **Trapping**:
      Trapping is another crucial method for managing rodent populations. Traps can help reduce rodent numbers and monitor activity. There are various types of traps, and the choice of trap depends on the severity of the infestation and the desired outcome.
        - **Snap Traps**: Snap traps are traditional and effective for killing rodents quickly. They are usually placed along walls or other pathways where rodents are likely to travel. Proper placement is essential to increase the likelihood of catching the rodent.
        - **Live Traps**: Live traps capture rodents without harming them. They are often used when there is a need to relocate animals or when dealing with non-lethal approaches. After capturing the rodent, the trap should be checked frequently to ensure the animal does not suffer due to confinement.
        - **Electronic Traps**: Electronic traps deliver a quick, humane electric shock to rodents when they enter the trap. They are an effective alternative to snap traps, and some models even offer the convenience of automatic disposal.
- **Chemical Control**
  When exclusion and trapping are not enough to manage rodent populations, chemical control methods, particularly rodenticides, may be necessary. Rodenticides are poisons designed to kill rodents and are typically used in areas with high rodent activity, such as grain storage facilities or barns.
    - **Rodenticides:**
      Rodenticides are often used when rodent populations are too large to control with trapping or exclusion alone. There are several types of rodenticides, each with a different mechanism of action:
        - **Anticoagulants**: These rodenticides, such as brodifacoum or warfarin, prevent blood from clotting, causing rodents to die from internal bleeding after consuming the poison. Anticoagulants are often used in bait stations and are considered effective against both rats and mice.
        - **Non-Anticoagulant Rodenticides**: These work differently, often affecting the rodent's nervous system. An example is zinc phosphide, which reacts with stomach acid to release gas, causing the rodent to die from poisoning. These are typically more toxic and require careful handling.
        - **Baiting**: Rodenticides are often applied in bait stations, which are secure, tamper-resistant containers designed to prevent non-target

animals and humans from accessing the poison. Baiting can be done in areas with high rodent traffic or near burrows. It is important to place baits in strategic locations where rodents are likely to feed, such as along walls, in storage areas, or near food sources.

- **Risks and Considerations**: The use of rodenticides must be carefully managed to minimize risks to non-target species, such as wildlife, pets, and beneficial predators. It is essential to follow guidelines for safe application, such as wearing gloves and ensuring that baits are not accessible to non-target animals.

- **Biological Control**

  Biological control for rodents is less common and less widely practiced than for insect pests. However, some natural predators can help reduce rodent populations and are particularly useful in certain environments. Raptors, such as owls and hawks, can be highly effective in managing rodent populations in open fields, orchards, or barnyards.

  - **Cats** serve as a form of biological control for rodents on farms by preying on rats and mice, which can damage crops, contaminate stored grains, and spread diseases. Their presence alone often deters rodents, while active hunting helps reduce rodent populations, making them an effective and sustainable pest management strategy in agricultural settings.
    - While cats are effective biological control agents for rodents on farms, a significant downside is their impact on native bird populations and other wildlife. Cats are opportunistic hunters and may prey on small birds, reptiles, and mammals, potentially threatening local biodiversity and disrupting ecosystems. This unintended consequence highlights the need for responsible cat management, such as neutering, providing adequate food to reduce hunting, and limiting free-roaming behavior, especially near ecologically sensitive areas.
  - **Raptors (Owls and Hawks):**

    Birds of prey, especially barn owls and red-tailed hawks, are natural predators of rodents. By encouraging the presence of these raptors, farmers can create a natural rodent control system. Installing nest boxes for owls, or providing perching spots for hawks, can help attract these birds to agricultural areas.

        - **Barn Owl Boxes**: In areas where rodent control is needed, farmers may install barn owl boxes in barns, silos, or field margins to encourage owls to nest and hunt rodents. Owls can eat large numbers of mice and rats, especially at night, when rodents are most active.
        - **Habitat Modification**: Maintaining open spaces around buildings and fields can help make the environment more suitable for raptors to hunt. However, biological control through raptors is generally more effective as a supplement to other pest control strategies.
- **Case Study: Rodent Control in Grain Storage**
  A grain storage facility in Ontario faces significant rodent pressure due to the abundance of stored grains and the proximity to surrounding fields. The facility implements a combination of physical, chemical, and biological control methods to manage the rodent population effectively.
    - **Exclusion**: The facility conducts a thorough inspection of all walls, doors, and windows, sealing any cracks, gaps, or holes where rodents could enter. They use steel mesh to cover ventilation openings and ensure that all doors are properly sealed with weather stripping.
    - **Trapping**: The facility uses a mix of snap traps and live traps in areas with known rodent activity, such as near the grain bins and around the perimeter. Traps are placed in areas where rodents are likely to travel, like along walls or near burrows.
    - **Rodenticide Use:** In areas with high rodent activity, bait stations filled with anticoagulant rodenticides are strategically placed. The bait stations are checked regularly to ensure that they are properly maintained and that no non-target species can access the bait.
    - **Monitoring**: The facility uses motion-sensor cameras and regular inspections to monitor the effectiveness of the control methods. Monitoring also includes checking trap catches and ensuring that there is no new rodent activity. If necessary, additional baiting or trapping is conducted.
    - **Biological Control:** The facility encourages barn owls to nest nearby by installing owl boxes around the facility. These natural predators help keep the rodent population in check, particularly during the colder months when other control methods may be less effective.
- **Homework/Challenge**
    - Assignment: Develop a comprehensive rodent control plan for a farm or storage facility of your choice. Your plan should include:
        - Exclusion strategies (e.g., sealing gaps, installing door sweeps)
        - Monitoring methods (e.g., trapping, bait stations, visual inspections)
        - Control interventions (e.g., trapping methods, rodenticides, or biological control)
- Provide a brief explanation for each strategy and describe how they will work together to minimize rodent damage. Consider the risks to non-target species and human health, and suggest ways to mitigate these risks.

## Conclusion

Rodent control requires a multi-faceted approach that combines physical, chemical, and biological methods to reduce rodent populations and prevent infestations. By implementing exclusion techniques, setting traps, using rodenticides when necessary, and encouraging natural predators, farmers and facility managers can maintain rodent populations at manageable levels. This integrated approach minimizes the impact of rodents on crops, stored goods, and infrastructure while safeguarding the environment and non-target species. Effective rodent control relies on careful planning, monitoring, and the use of appropriate interventions to ensure sustainable pest management