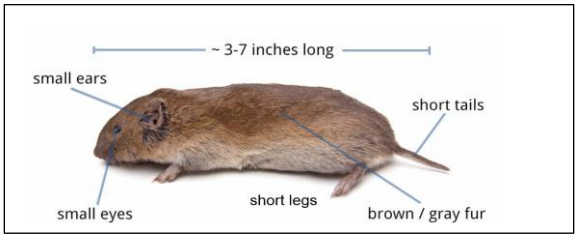
Vole Scouting FS-2



Introduction

Vole damage to agricultural grain crops have become a major problem, especially in no-till and cover cropped fields. With greater food sources and adequate shelter, vole numbers may increase dramatically. Understanding vole biology is the first step to controlling vole damage. The second step is to conduct vole scouting and understanding what factors attract voles to agricultural fields. This is a critical step to controlling vole populations.

Agricultural Vole Damage

A vole colony may range from 15 feet up to ¼ of an acre. Voles may significantly reduce corn or soybean stands during the first 21-28 days after planting. Voles will eat seeds until the seeds decays or plants reach 8-10 inches tall. Voles will dig up newly planted seeds or eat succulent plant tips or soybean cotyledons and soybean pods. Voles also eat weeds and any close weedy vegetation. An economic threshold in the Northwest, USA is approximately 4 – 5 vole colonies in close proximity (Oregon State University) but this level may not apply to Midwest, USA agricultural areas. The best scouting time for voles is to start in the fall and then 30-45 days before planting starting in March.

In agricultural fields, voles will move into newly harvested fields before or after harvest to forage for unharvested seed (wheat, corn, soybeans). These areas become a haven for vole colonies if they are not disturbed (no-till) and especially if cover crops are sown. Thick growing, tall dense vegetation provides food, shelter from predators, and insulation from low winter temperatures. Voles prefer thick dense matts of vegetation for burrows. Broadcasting cover crop seed (especially cereal rye seed) on the soil surface is an easy food source for voles, drilling seed is more effective. Voles also like to locate in high residue areas with chaff, so distribute and spread crop residue evenly over the soil surface.

Vole burrows and tunnels.

Source: Alan Sundermeier, OSU Extension, Bowling Green, Ohio

In the spring, voles prefer to feed on whole soybeans and emerging soybean cotyledons (high protein, low lignin content). Most bare spots in a field come from voles digging up and

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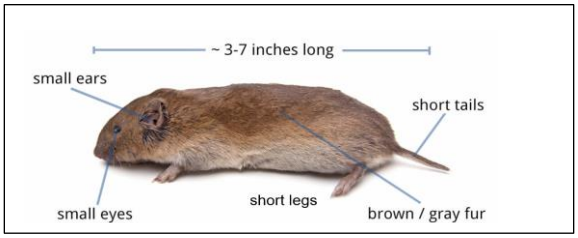

eating the seed or from voles eating off the emerging growing point. Drilling seed is better and planting seed >2 inches deep reduces vole damage because the voles may not smell or locate the seed as easily. Increasing the seeding rate may help compensate for reduce plant populations.

Open Seed Trench Source: Ag Talk

After spring planting, voles will follow the soybean row and dig up soybean seed. Row furrows that are not fully closed due to wet planting conditions allow voles to easily feast on emerging soybean cotyledons. At high vole densities, voles tend to eat and forage for all food sources and greatly reduce plant populations resulting in reduced crop yields.

Farmers often see the vole damage long after the voles have eaten. Upon inspection, vole burrows may appear to be inactive. Voles migrate when food sources become scarce. In a soybean field, irregular bare patches may be seen. Voles then will eat weed seeds and small vegetation in their area until the soybeans get too tall (>8 inches tall). At this time, many voles may begin migrating to new areas until the soybeans are ready to harvest. Voles are good swimmers and may travel 1.6 miles to migrate. The critical time period for preventing vole damage is 3-4 weeks after planting. In some fields with heavy vole populations, 80 to 100% yield damage is possible. Replanting into these fields is not advised unless the vole population is reduced, because replanting provides voles with food.

Vole damage in no-till fields and cover crops generally exceeds vole damage in conventional fields. Tillage disrupts the vole colonies and destroys nests and young vole pups. It also buries the food source and tillage may kill a few voles. Drilling is preferred over planting in 15 or 30-inch rows because the act of drilling (disks 7” apart) results in some vole getting terminated or disrupts vole nesting. In conventional tilled fields, most vole damage occurs along field edges, waterways, buffers, and fence rows. Tillage has been shown to reduce vole populations by 60%, but under high vole densities, this practice alone may not control the vole population. Multiple strategies may be needed to reduce vole numbers to economically acceptable levels.

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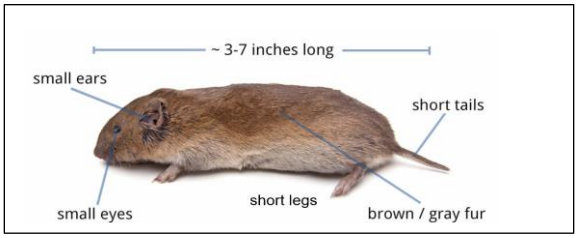

Extensive vole damage in a soybean Field. Source: Alan Sundermeier, OSU Extension, Bowling Green, Ohio

Scouting

1) Start Fall Scouting after harvest. If >5 vole colonies/acre, consider control options.
2) Monitor fields in the winter for vole activity. Voles will travel under the snow, but look for vole tracks above ground on the snow surface if there are high vole numbers.
3) Scout fields at least 30-45 days before planting. If >5 colonies per acre, consider control options. Kill all vegetation 30 days before planting.
4) Scout for voles one week before planting. If >5 colonies per acre, consider repellants, alternative feeds, toxicants (baits), and other control practices.

To control voles, there are five major things to consider: food; shelter; predators; use repellants, alternative feeds, or toxicants (baits); or adapt management practices that reduce vole numbers. Multiple strategies are generally needed to control or reduce vole numbers and density to an acceptable level.

The first step is to reduce food sources and shelter. Grasses and clovers seem to be the most attractive to voles. If using cover crops, consider the following practices:

1) Rotate mixes and **do not broadcast cover crop seed.**
2) Selecting a cover crop mix that contains **50%** species that winter kill.
3) Plant cover crops that are not food sources (e.g. **crimson clover**)
4) Drill CC, do not allow any grass to mature or create a seed head for food.

Selecting a cover crop mix that contains 50% species that winter kill may provide a less favorable vole habitat and still retain most of the conservation benefits. Voles eat many different types of foods. In the spring and summer, they primarily consume living plants (grasses, sedges, plantain, and a wide variety of “weeds”). In the fall and winter, they switch over to grains, seeds, bark, roots, and over-wintering fruits.

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Soil Health Division, June 2018

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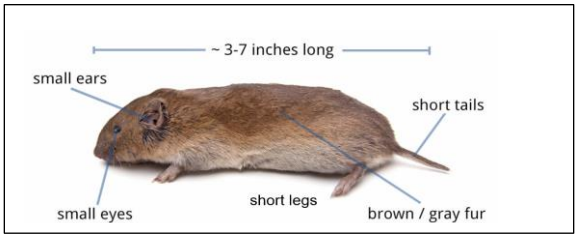

Key point: ***Voles must eat their body weight in food every day to survive. Voles also need to eat every 2-3 hours*.** Since voles do not hibernate and do not store a lot of food, they are forced to actively forage every day of the year. Disrupting vole food sources or shelter for a short period of time can be extremely detrimental to vole populations, especially in the spring when their numbers are at their lowest point.

Planting Green into cover crops is acceptable if vole populations are low and the system is ecologically balanced and crop damage is minor.

For producers who like to plant green into a cover crop, if vole numbers are low and yield losses are not high, this is still an acceptable practice, especially if plenty of predators are present. However, if vole numbers increase and yields start to decline, changing the cover crop mix, adding species that winter kill, mowing, and as a last resort killing vegetation early in the spring may help reduce vole populations. Promoting high predation may be an acceptable way to limit or reduce vole numbers, Producers who integrate several soil health practices appear to have fewer problems with pests (including voles and slugs) because their ecological system is in balance.

Cultural Practices to Reduce Vole Numbers

- Plant crimson clover as a non-food source for voles. May need to plant an early maturing grain crop to plant crimson clover. In the Midwest, August-September planting dates are suggested. Crimson clover seed could be broadcast or aerially seeded (because voles dislike crimson clover) while most other cover crop seeds that are potential food sources should be drilled.
- Modify Cover: Avoid planting grasses and seeds that provide a food source. Avoid planting cover crops that are too tall or thick if high vole populations occur at harvest.
- Selecting a cover crop mix that contains 50% species that winter kill may provide a less favorable vole habitat and still retain most of the conservation benefits. A good

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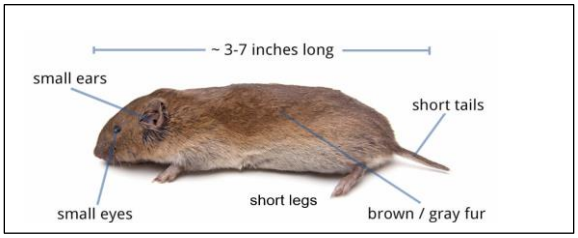

cover crop mixture: Drilled oats, crimson clover, radish (>50 percent winter kill).

- For cereal rye, reduce the rate by adding another cover crop species: oats, kale or crimson clover. Avoid adding rape or canola to a fall cover crop mix because it is another vole preferred food source.
- Plant and drill grain crops at least 2" deep so voles may not smell the seed. Make sure the planting slot is well covered.
- Use early herbicides to terminate cover crops 30 days before planting (Minimum 21-28 days). Purdue University study found that early vegetation termination plus mowing were the two most effective vole control measures.
- Keep borders mowed close especially around fence rows, waterways, buffers, road ditches, and edge of woods. Mowing

Mowing cover crops reduces vole food and shelter. Source: worldpress.com.

- covers less than <8 inches opens the landscape up to predators. Keep the cover crop vegetation low by either mowing or modifying the cover crop seeding mixture.
- For NRCS government contracts, discuss these practices with your local representative before implementing. Mowing may affect other resource concerns (wildlife, rabbits, and quail) and your government payment.

Summary

This fact sheet covers scouting for voles and reducing vole food and shelter. Controlling vegetation density by mowing, terminating vegetation 30 days before planting, and using 50% cover crop species that die out in the winter or are non-food sources are key practices that may reduce vole density on agricultural fields. Drilling cover crop seed versus broadcast spreading also reduces the seed as a food source. The third fact sheet in this series will discuss using and promoting predators to reduce vole populations.

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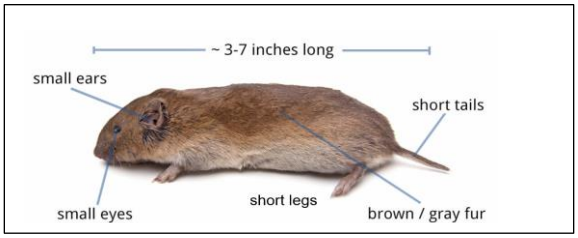

Fact sheets in this Series:

1) Vole Biology FS-1
2) Vole Scouting FS-2
3) Vole Predators FS-3
4) Vole Repellants & Baits FS-4
5) Vole Management Practices FS-5

References

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Aerial vole damage appears to be dead zones in a crop field. These vole damaged areas appear oval or oblong and may be 0.25 acres in size. To minimize crop damage, reduce vole colonies to less than 5 colonies per acre.

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