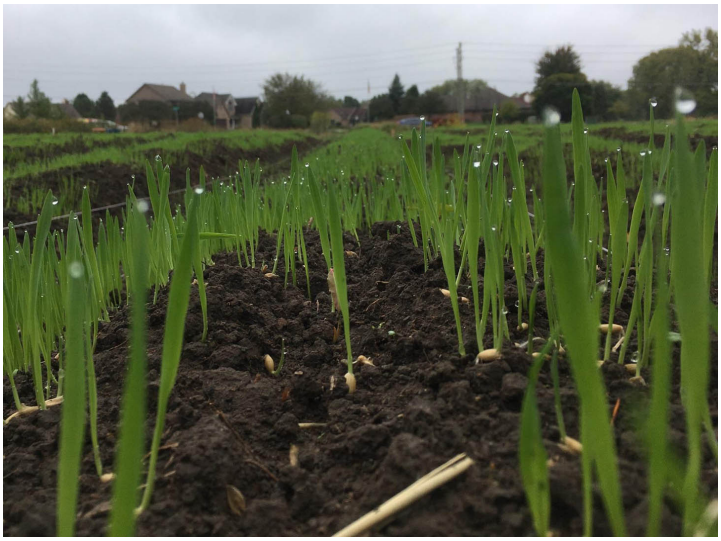
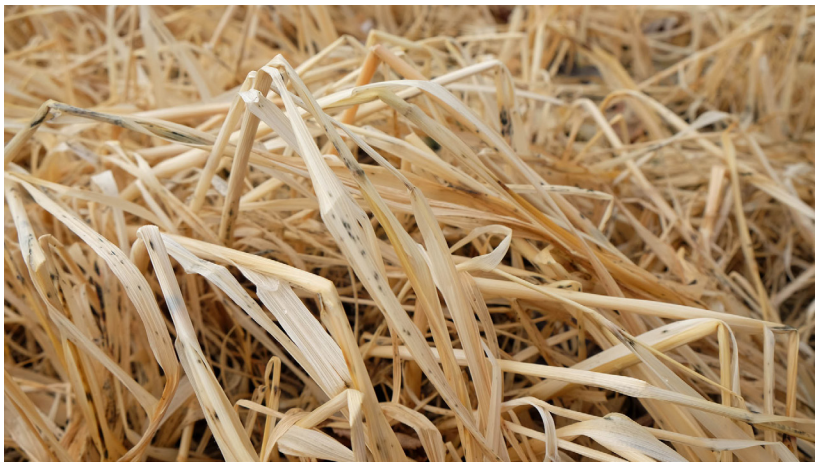
OATS COVER CROP TECH NOTE

MARION COUNTY SOIL AND WATER CONSERVATION DISTRICT





COVER CROP PROFILE	
Common Name	Oats
Scientific Name	*Avena sativa*
Cover Crop Type	Cereal / No Nitrogen Fixation
Life Cycle	Annual
Winter Survival	Seldom / Occasionally
Growth Habit	Upright
Growth Height	12' - 24'
SEEDING INFORMATION	
Northern IN Planting Dates	August 15 - September 15
Southern IN Planting Dates	August 15 - September 30
Seeding Rate	4 oz / 100 square feet
Seeding Rate (in a mix)	1 oz / 100 square feet
Seeding Depth	1/2" to 1"
Germination Period	~ 8 days

BENEFITS OF OATS

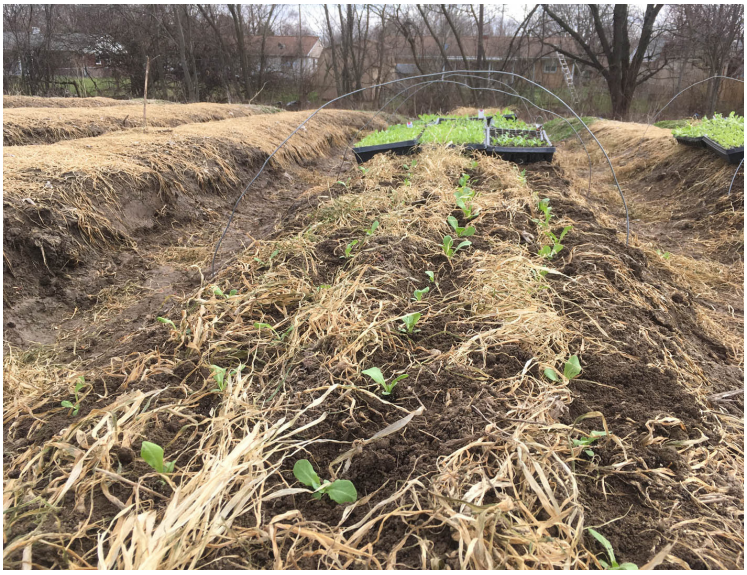
Ranked out of 4 stars

Erosion Preventer	★★★★
Weed Fighter	★★★★
Mycorrhizal Builder	★★★★
Nitrogen Scavenger	★★★
Soil Builder	★★★
Topsoil Loosener	★★★

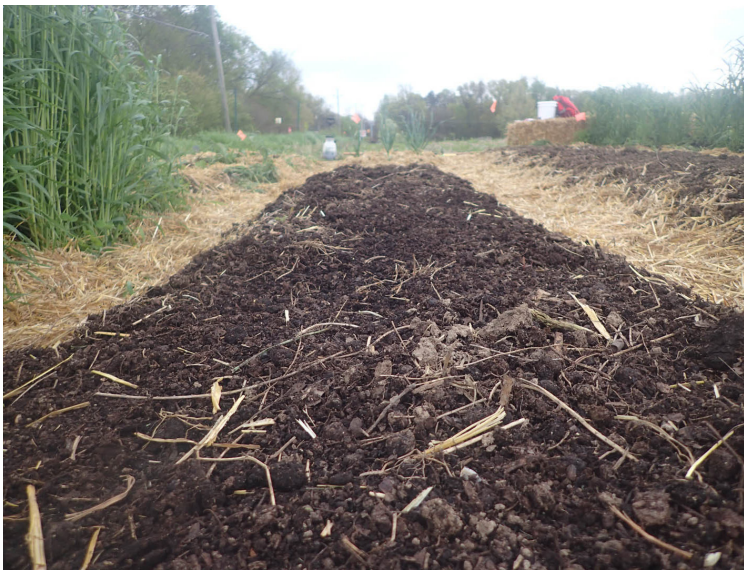
Oats are a go-to cover crop for both beginners and seasoned growers. Its many benefits include quick growth, weed suppression, and its positive relationship with mycorrhizal fungi in the soil. When fall planted in Indiana, oats typically winterkill, or are terminated by cold temperatures and frost, and the dead mulch covers the soil surface throughout winter. In late winter or early spring, there are a numerous ways to manage the winterkilled mulch and prepare the garden bed for the following crop. **This document demonstrates strategies and management considerations for using a winterkilled cover crop to prepare a garden bed for a no-till or low disturbance vegetable planting.**

Transplanting Spring Crops into Winterkilled Oat Mulch

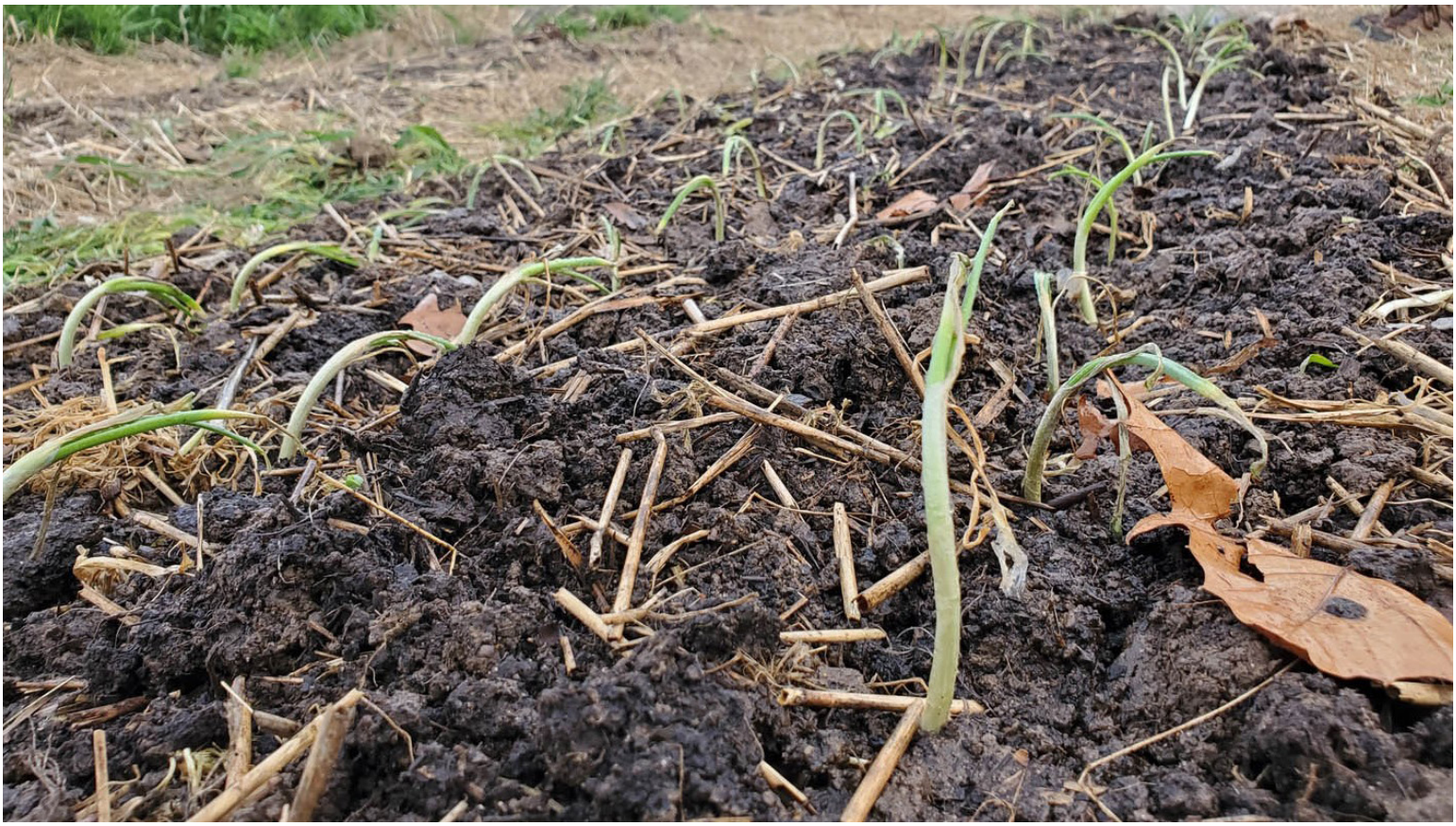
One tactic is to leave the oat mulch in place and transplant early spring vegetables directly into spaces made in the mulch. With thick mulch, larger vegetable seedlings are easier to plant. Raking mulch off of the surface of the bed or creating spaces or largbefore planting may be appropriate for fragile transplants.



Winterkilled oats > Leave mulch > Transplant lettuce



Adding an additional top layer of mulch or compost can increase weed suppression. Direct seeding is also possible in this scenario.

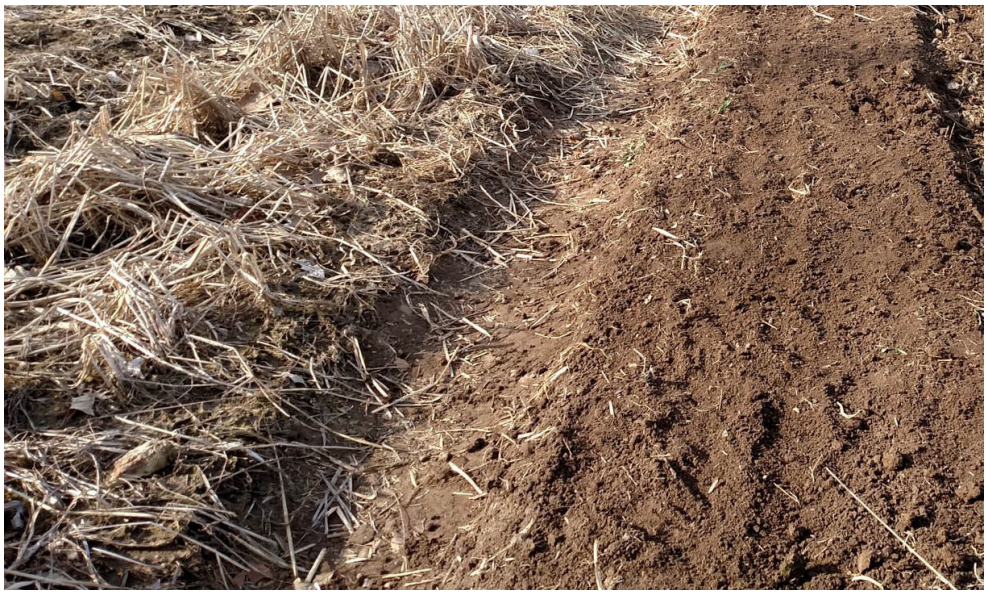


Winterkilled oats > Rake off some mulch > Add compost > Transplant onions

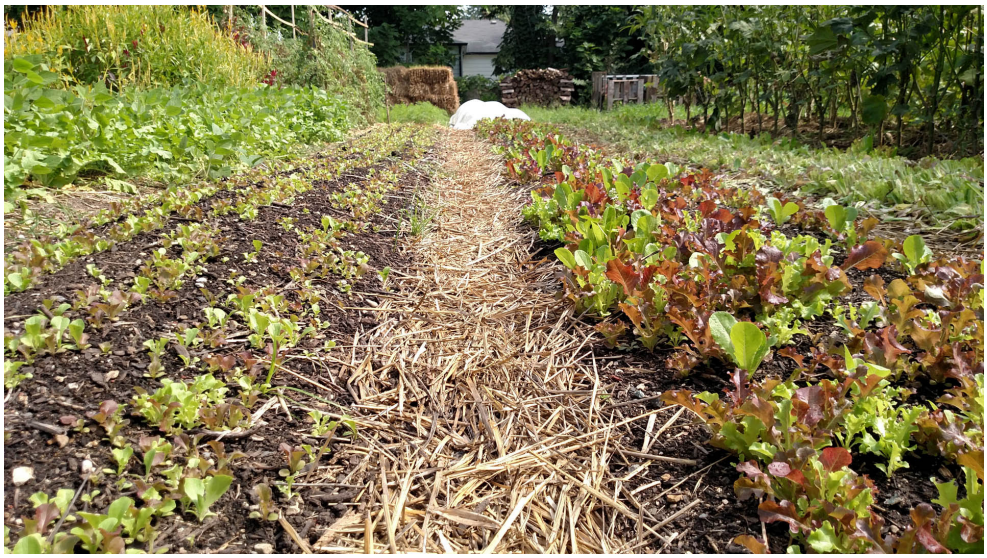
Seeding Spring Crops after Winterkilled Oats

Direct seeding spring vegetables is a viable option after oats. While larger seeded crops generally fair well when seeded into thick mulch, many of the small seeded vegetables have higher germination rates in beds with less crop residue. Remove or rake off the mulch, add compost if needed, create furrows, and seed according to the crop's seed depth recommendations. Less residue may be more conducive to certain direct seeding tools.

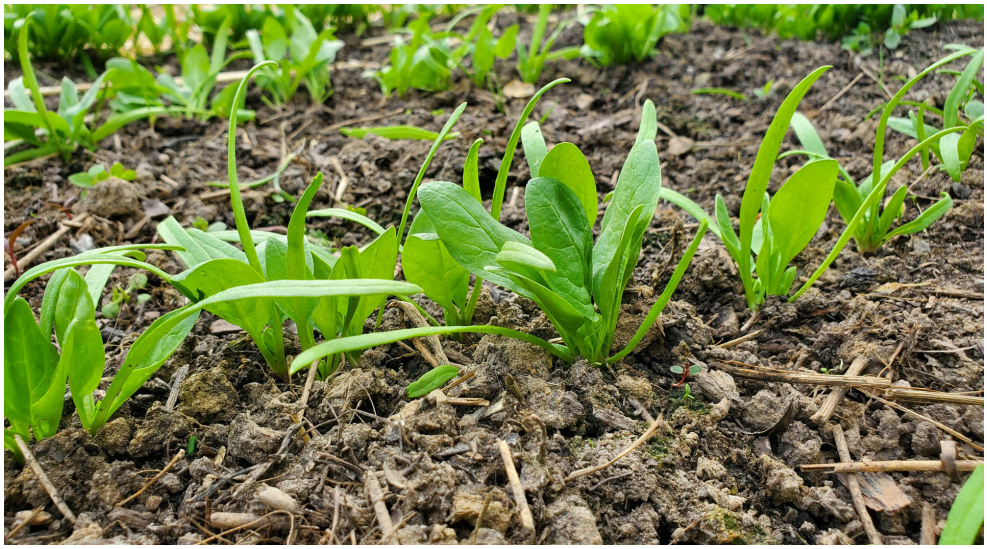
Pointed hoes, warren hoes, and hand trowels are examples of good furrowing tools for this task (above).



Remove mulch to prepare for direct seeding of vegetables



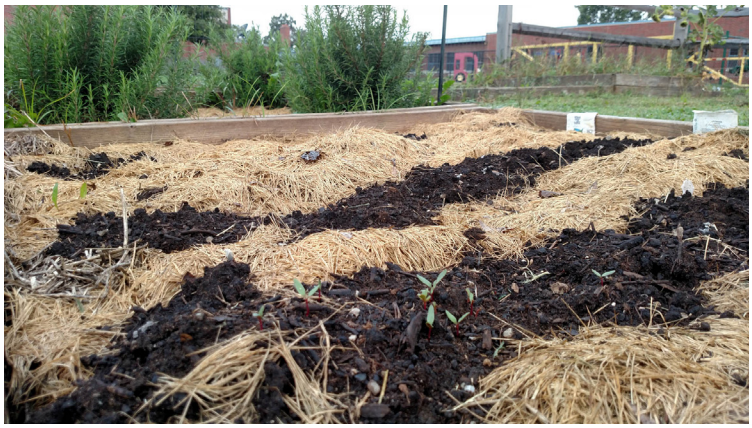
Rake off mulch into pathway > Furrow rows > Direct seed lettuce



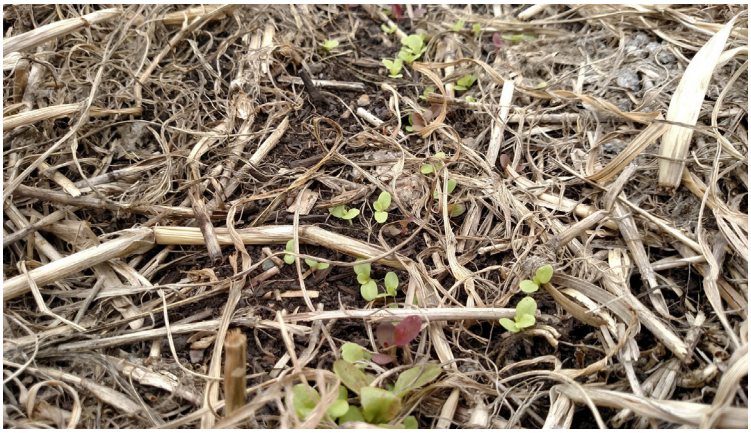
Rake off mulch > Furrow rows > Direct seed spinach

Seeding Spring Crops after Winterkilled Oats with Mulch

Removing the mulch and direct seeding is a reliable strategy, but no-till growers can also experiment with leaving the mulch in place and seeding a crop. Reducing soil disturbance and maximizing cover benefits soil health, retains soil moisture, and suppresses weeds. One technique is to cut or mow the winterkilled mulch into finer pieces, add a layer of mulching compost on top, and then direct seed the crop. Certain small seeded crops like leaf lettuce can be broadcasted and lightly incorporated. If compost is not being used, use a sharp knife or similar tool to cut a planting slit through the mulch.



Winterkilled oats > Add compost > Direct seed

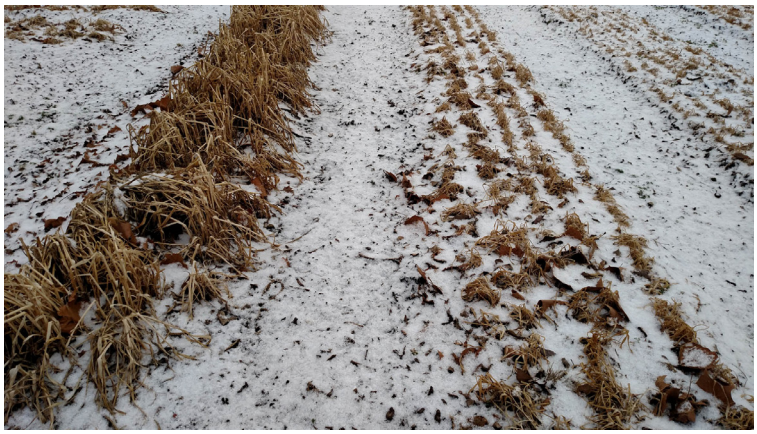


Winterkilled oats > Direct seed lettuce

Winterkilled oats > Create slice, seed trench, or jab seed in > Direct seed

ADDITIONAL CONSIDERATIONS

Mulch Biomass and Decomposition

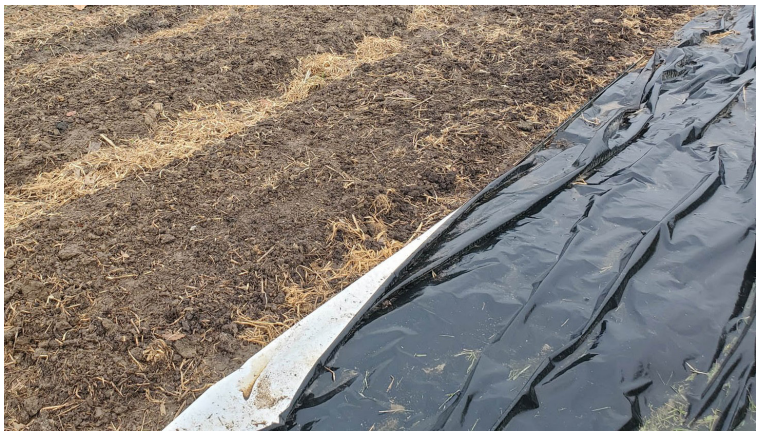


Plant oats earlier in their seeding window to encourage vigorous fall growth and **biomass**. The bed on the left, planted earlier in the fall than the bed on the right, produced more roots and mulch (above). Aim for at least six to 10 weeks of cool-season growth. A thick stand can leave a long-lasting mulch.

Decomposition will occur as temperature and biological activity increases. If desired, cut or mow the mulch into smaller pieces or top with compost to accelerate the process. As the mulch decomposes, weed suppression decreases. Plant early spring vegetables to provide a crop canopy to maintain soil cover and weed suppression. Be prepared to weed later in the season or add straw mulch or residues to continue weed suppression.

Weed Control

Cover crops suppress **weeds** but are not always 100% effective and oats occasionally survive warm winters. Spot weed, tarp, carefully flame weed, mulch up, or utlize other additional measures to terminate any weeds or undesired spring oat growth before planting a crop. Ensure mulches are weed and seed free before applying. Termination can also be accomplished by cutting the oats down when the grain heads are visible, have a doughy texture, and before the seeds begin to harden.



Occultation is the process of of terminating vegetation by inhibiting sunlight with a black tarp. Covering the bed with a tarp or **solarization** with clear plastic are tactics that can be utlized to control weeds or terminate cover crops. A tarp laid over the winterkilled oats for 3 to 4 weeks in March terminated the chickweed and could be pulled back, bed by bed, for spring planting (above).

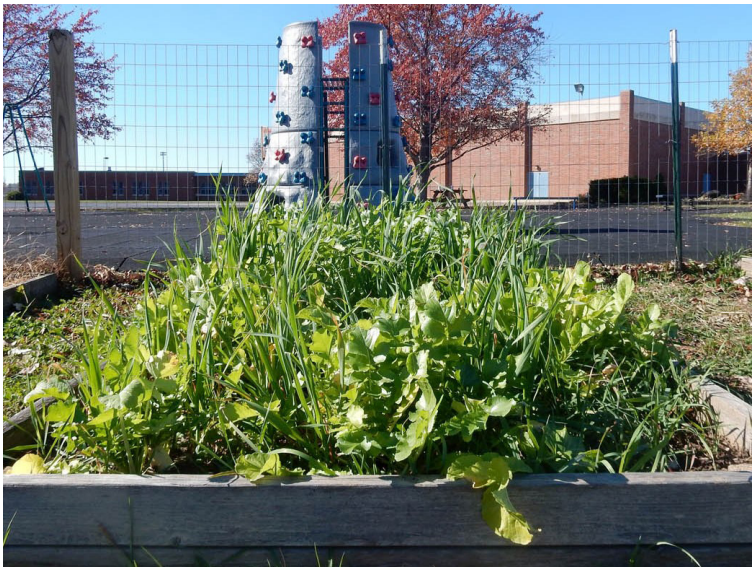
ADDITIONAL CONSIDERATIONS

Planting and Interseeding

Oats are well-suited for fall in Indiana but can also be planted in the **spring and summer** to grow cover and mulch in gaps between vegetable crops. Note that stands generally fare poorly in hot, dry weather and benefit from timely rains or irrigation. Oats may produce grain and seeds before winterkilling. Terminate prior to prevent reseeding.

Interseeding under existing crops is doable but oats tend to not perform well in shade or low-moisture and germination and growth may be hindered. A mix of oats and crimson clover interseeded under mature tomatoes in September produced sparse oats and a good stand of crimson clover (above).

Oats in Cover Crop Mixes



While effective as a single species cover crop, oats are an excellent addition to **cover crop mixes**. Mixing oats with other winterkilled species such as daikon radishes and/or field peas increases cover crop diversity and promotes soil health. Note that the residue from these two particular cover crops often decompose more readily and produce a shorter-lived spring mulch than oats alone. Favor oats if the goal is a thick mulch.

If the goal is an overwintering cover crop, oats serve as an excellent **companion or nurse crop** to provide added weed suppression, biomass, and biodiversity. The oats winterkill and provide warmth and a wind break to help ensure a legume cover crop's winter survival. The oats winterkilled and the crimson clover survived (above).

Cover crops are a key tool in a soil health system:

- Minimize Disturbance
- Maximize Soil Cover
- Maximize Biodiversity
- Maximize Continuous Living Roots

Prepared by Kevin Allison, Marion County SWCD
www.marionswcd.org
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Information is based on NRCS conservation practices, grower experience, SARE Managing Cover Crops Profitably 3rd Edition - Oats, and the Midwest Cover Crop Council Field Guide