

34th Annual
**NATIONAL
NO-TILLAGE
CONFERENCE**

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How to Plant Green Without Losing your Shirt

Rob Myers, University of Missouri



HORIZON





PRESENTATION OVERVIEW

Why consider planting green

Fall preparation

Termination timing

Equipment and other spring management

Potential green bridge issues

Impacts of cover crops on soil moisture

Summary of tips for success with planting green

Why Planting Green is Worth Considering

1. Weed control improvements
2. Soil moisture can be optimized
3. Planting may be easier with cover crop stems still upright
4. Cover crops can live long enough to flower, which is good for pollinators and beneficial insects
5. Erosion control
6. Soil biology enhanced
7. Builds soil organic matter faster
8. Opportunity for spring grazing



Cover crop can be short or tall when planting green

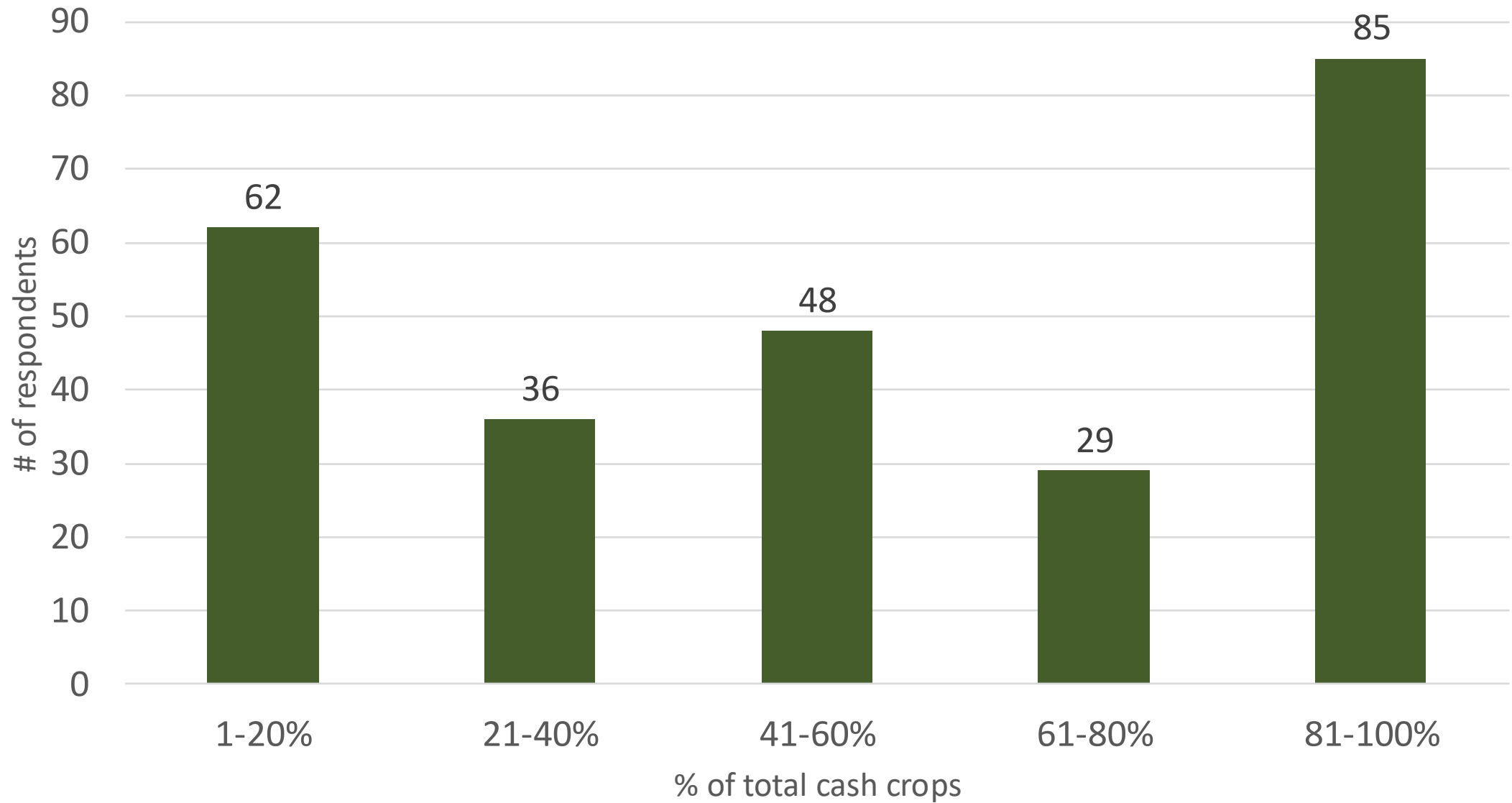


Planting Green into Tall Cereal Rye



Photo credit: Steve Groff

Extent of Planting Green in 2022



Farmer responses from 2022-23 SARE/CTIC National Cover Crop Survey

A close-up photograph of a field of red clover flowers. The flowers are in various stages of bloom, with some showing bright red petals and others as green buds. The background is a soft-focus green, suggesting more foliage. A semi-transparent green rectangular box is centered over the image, containing white text.

Fall Planning and Preparation

Fall Planning

Which cover crop will be seeded?

- Winter cereals may be easier to plant green into compared to options like hairy vetch, or high biomass mixes

What seeding rate to use?

- A lighter cover crop seeding rate can be used to make it easier to plant green, but pay attention to any seeding rate guidelines required for incentive payments

Special note

- A heavier seeding rate may be appropriate if grazing cover crops in fall and/or spring



Photo credit – Dave Petshek, Green Cover

Strip Till or Bio Strip Till May Ease Spring Planting





Cover Crop Spring Termination Timing

When to Terminate the Cover Crop Early

Advantages

- Prevents the cover crop from over drying the soil before planting
- Minimizes amount of cover crop residue to deal with in planting the cash crop
- May reduce the chance of some pest problems
- Often a more comfortable approach for first time cover crop users

Caution

- Avoid terminating a high biomass cover crop 10-14 days before cash crop planting; may end up making a wet mat that prevents soil from drying out



Terminating Cover Crops Late, Including “Planting Green”

Advantages

- Allowing the cover crop to grow longer maximizes cover crop benefits for soil organic matter, erosion reduction, weed control, soil health, etc.
- Longer period of cover crop growth can help draw down moisture in a wet spring and enable earlier cash crop planting
- Sometimes planting into a still standing and living cover crop (planting green) is easier than into a thick mat of dead cover crop residue

Caution!

- If spring conditions are trending dry, best to go ahead and terminate the cover crop earlier to avoid drying out soil



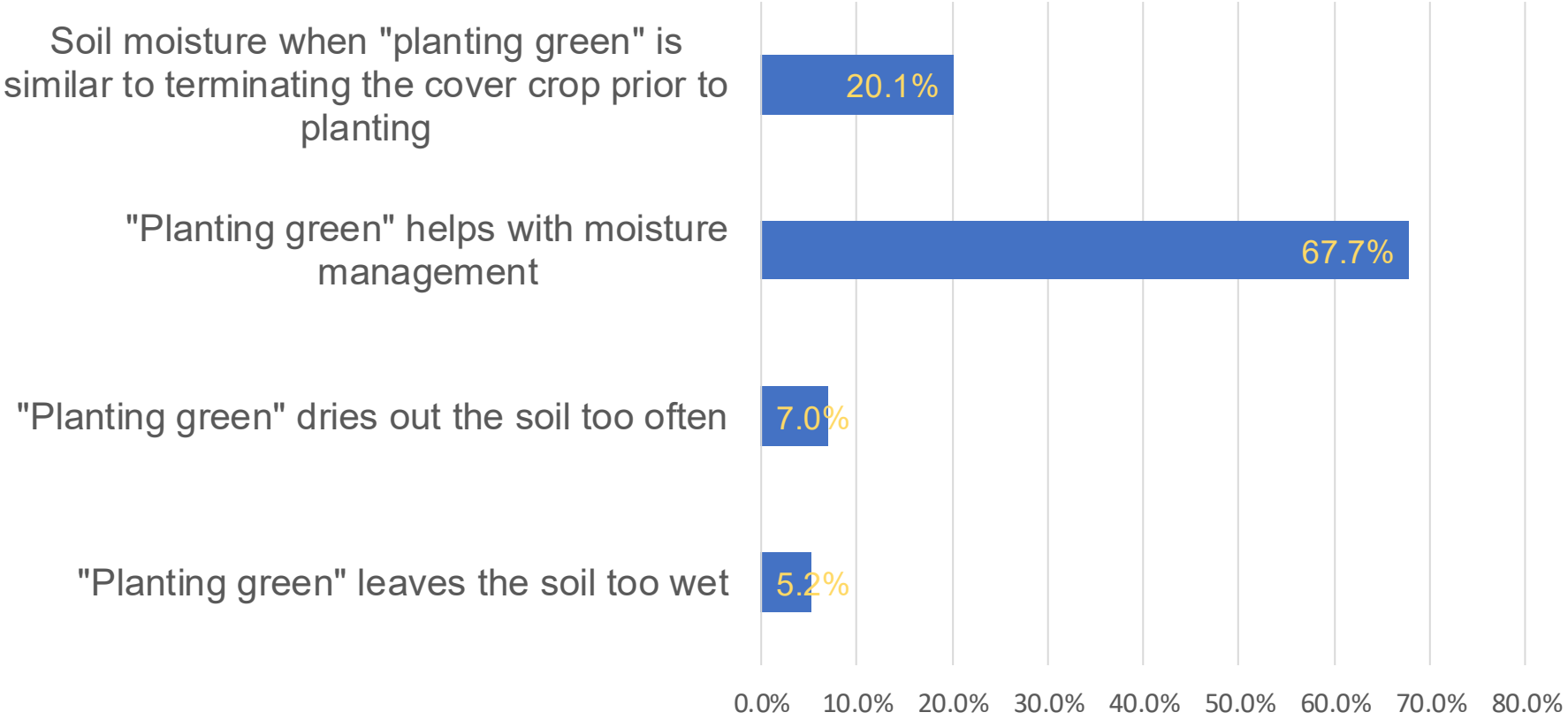
Photo credit – Dave Robinson

Planting Green Impacts on Soil Moisture



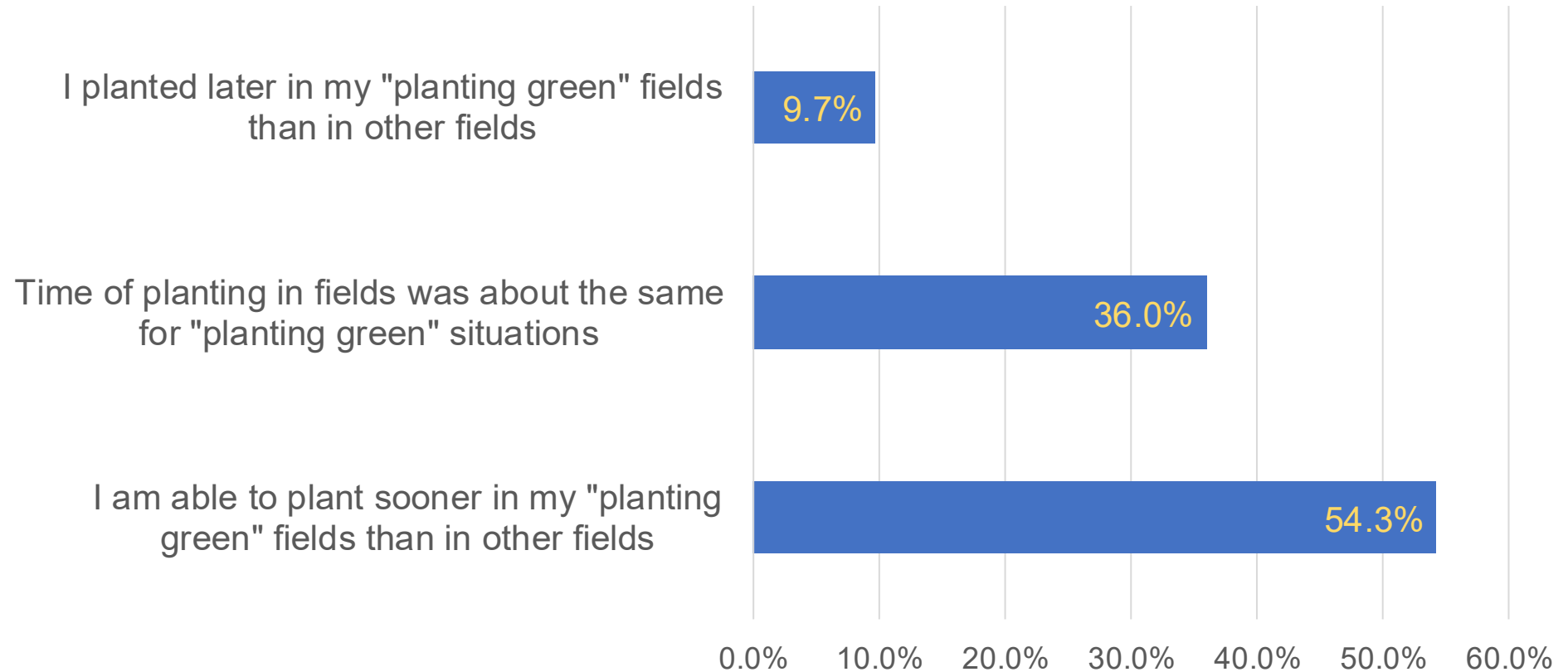
Photo credit: Steve Groff

How has planting green impacted soil moisture at the time of planting your cash crop?

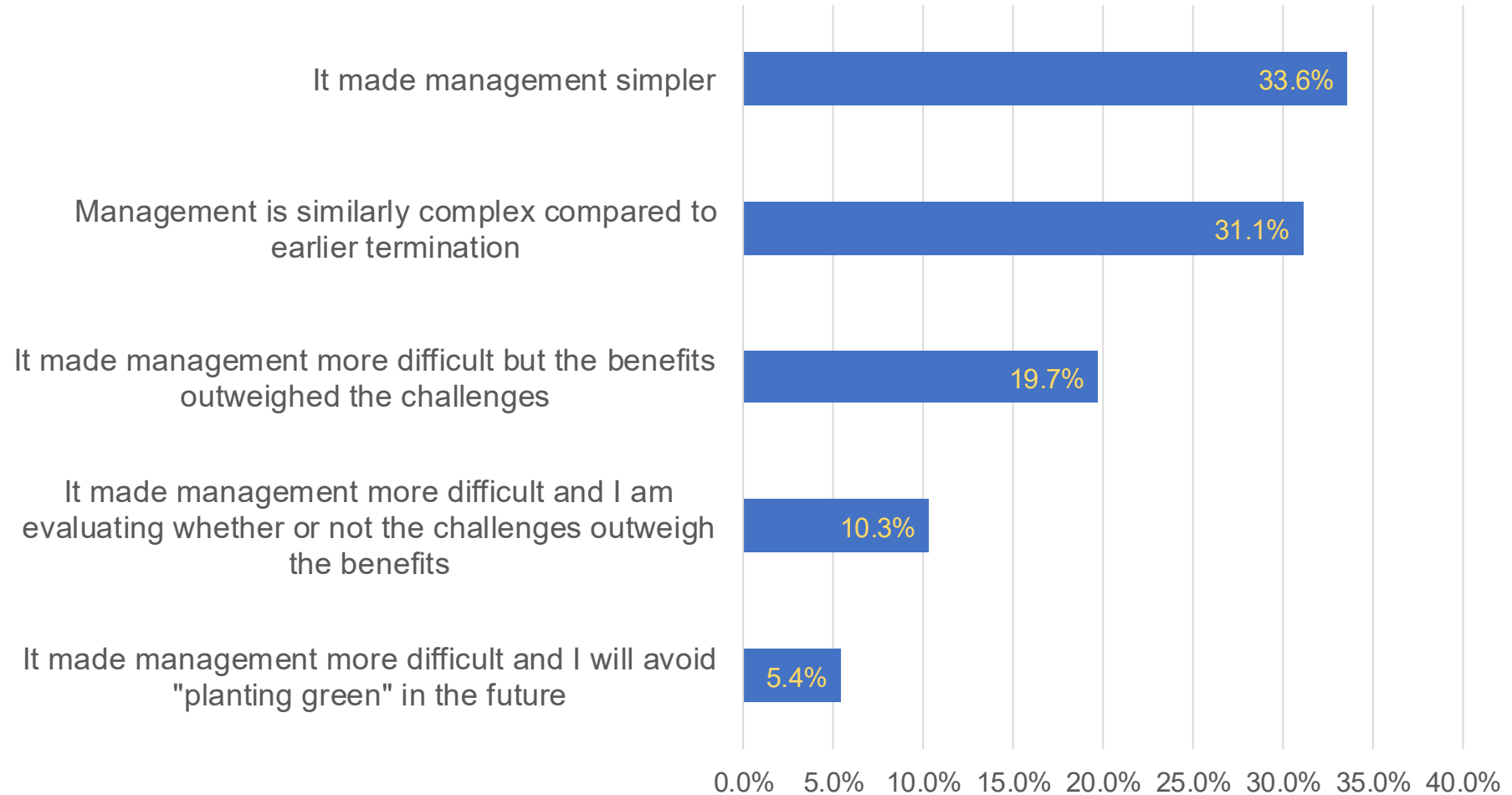


Data from 2019-20 SARE/CTIC National Cover Crop Survey

In terms of ease of planting your cash crop in "planting green" situations when soil is wet, what has been your experience compared to fields where the cover crop was either terminated earlier or not present?

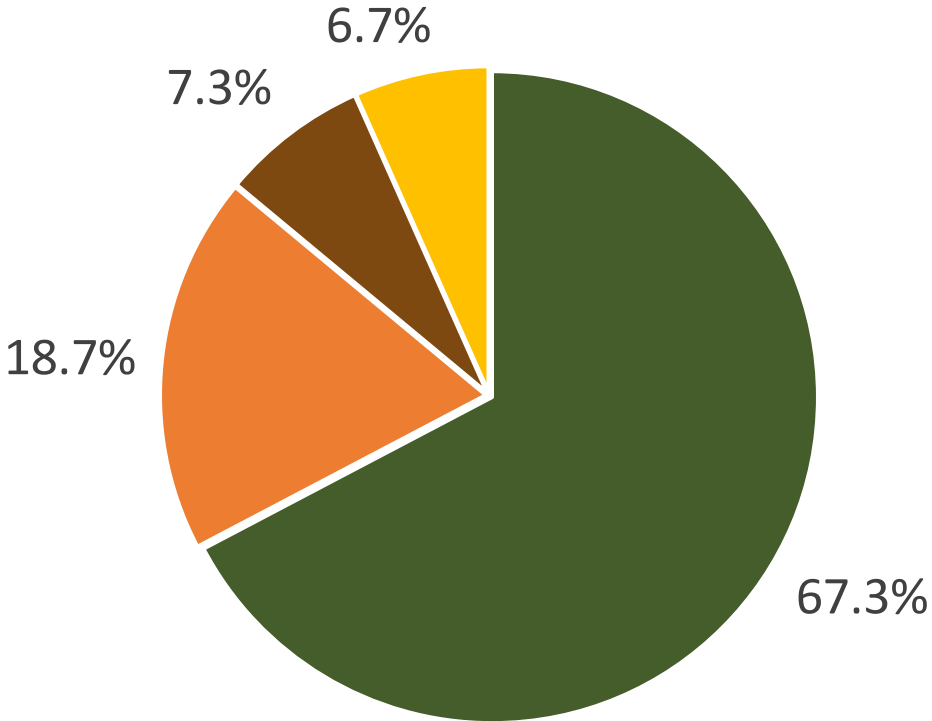


How Planting Green affects Cash Crop Management



Farmer responses from 2019-20 SARE/CTIC National Cover Crop Survey

Impact of Planting Green on Soil Moisture at Planting



- Helps with moisture management
- Similar to early termination
- Dries out soil too much
- Leaves soil too wet

Farmer responses from 2022-23 SARE/CTIC National Cover Crop Survey

Terminating by Crimping Cover Crop Stems

Some plain rollers can terminate a cover crop by breaking stems, but most often it works better to “crimp” the stems using a roller modified by edged steel vanes that can crush or break the vascular tissue (xylem and phloem) in the plant stems

- Usually works best if the cover crop has already reached the flowering (reproductive) stage
- Often better to roll after planting
- If rolling before planting, roll in same direction as planter is traveling



Photo credit: Edwin Remsburg (SARE image library)

Roller Crimper Equipment Options

There are now a dozen or more manufacturers selling roller crimpers, some mount in front of the tractor and some in rear, some are single rollers 10-15 feet wide, some are wider folding units with multiple offset and overlapping rollers. There are now even smaller roller-crimpers that can be added to the tool bar of a planter.



Photo credit: Advance Cover Crops (Dahmer roller)

Roller crimpers attached to a planter



Photo credit: Steve Groff

Do you have to roll down the cover crop when planting green?



Photo credit – Rob Myers



Soybeans
planted green
into cereal rye

June 26



Corn planted
green into mix
of wheat,
crimson clover
and balansa
clover

June 26

Corn planted
green into mix
of wheat,
crimson clover
and balansa
clover



Photo credit - Daniel Bonacker



A close-up photograph of a field of red clover flowers. The flowers are in various stages of bloom, with some showing bright red petals and others as green buds. The background is a soft-focus green, suggesting a healthy field. A semi-transparent green rectangular box is centered over the image, containing the text "Spring Planting and Equipment" in white, bold, sans-serif font.

Spring Planting and Equipment

Adjusting the Planter Settings for Planting Green



Wayne Fredericks planter as shown in Wallaces Farmer article (2018)

Dig Deeper on Cover Crops Videos

Tips from four Midwest farmers on Corn and Soybean Planter Settings for Cover Crops



Dig Deeper on Cover Crops with Christopher Hudson



Farmers for Soil Health

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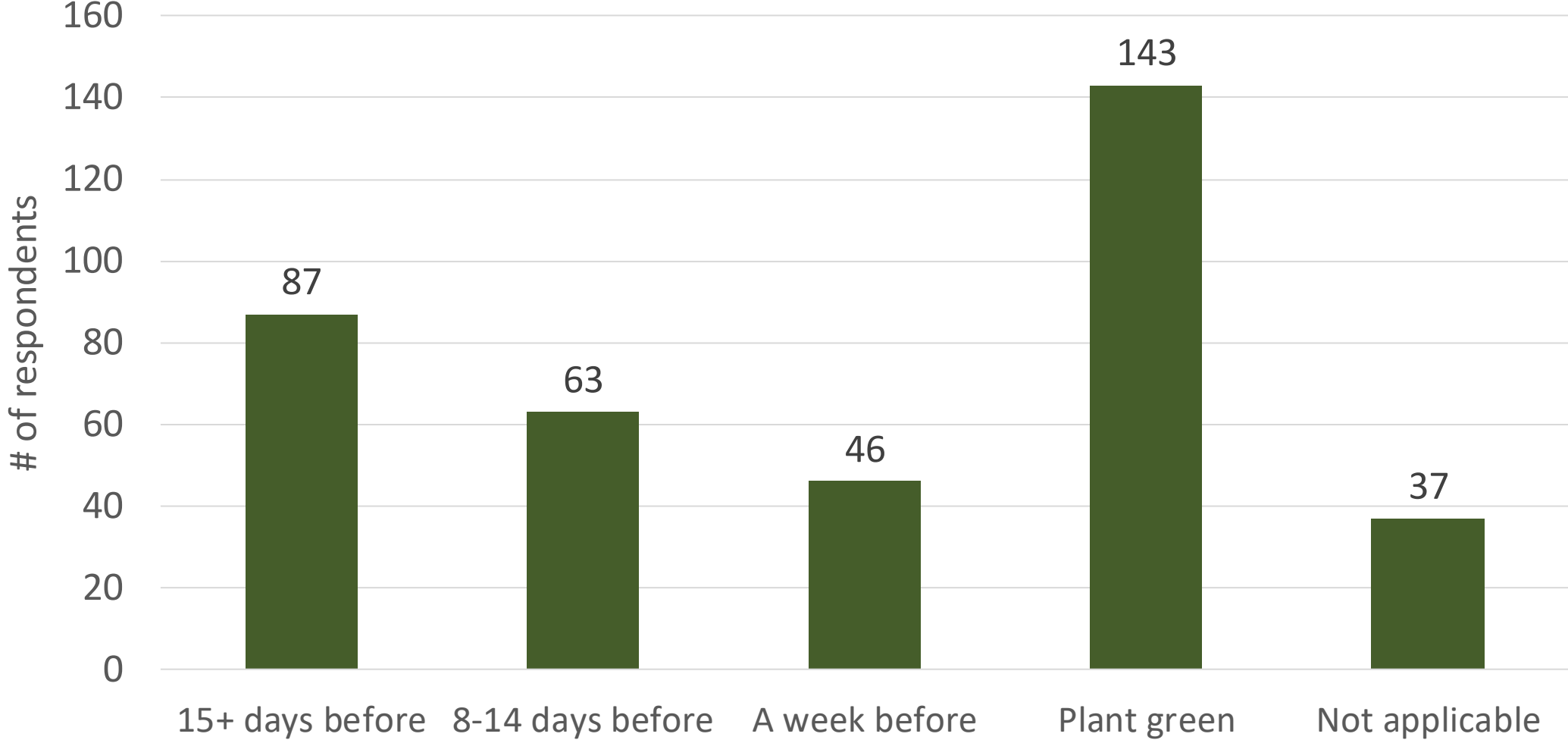


Managing corn after cover crops



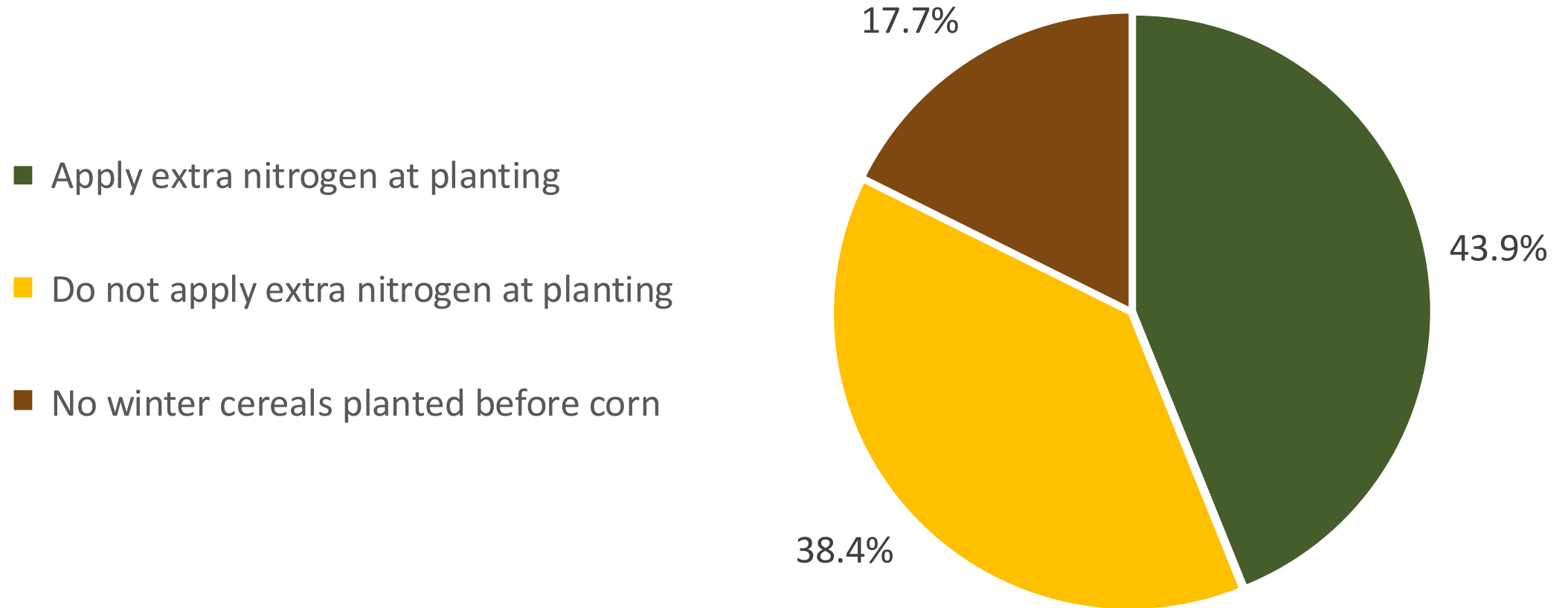
Photo credit – Ryan Heiniger

Cover Crop Termination Timing Before Planting Corn



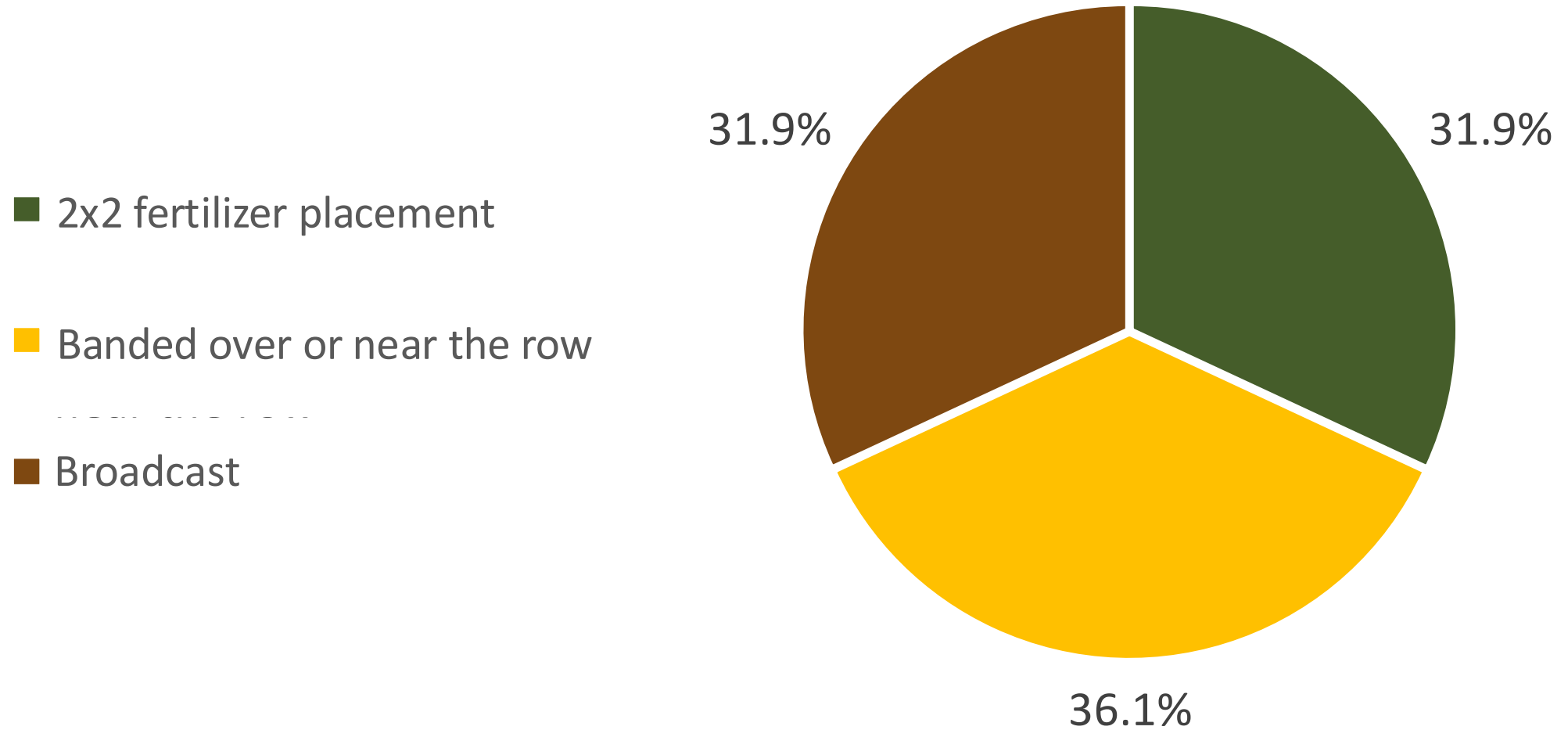
Farmer responses from 2022-23 SARE/CTIC National Cover Crop Survey

Corn Nitrogen Management After Cover Crops



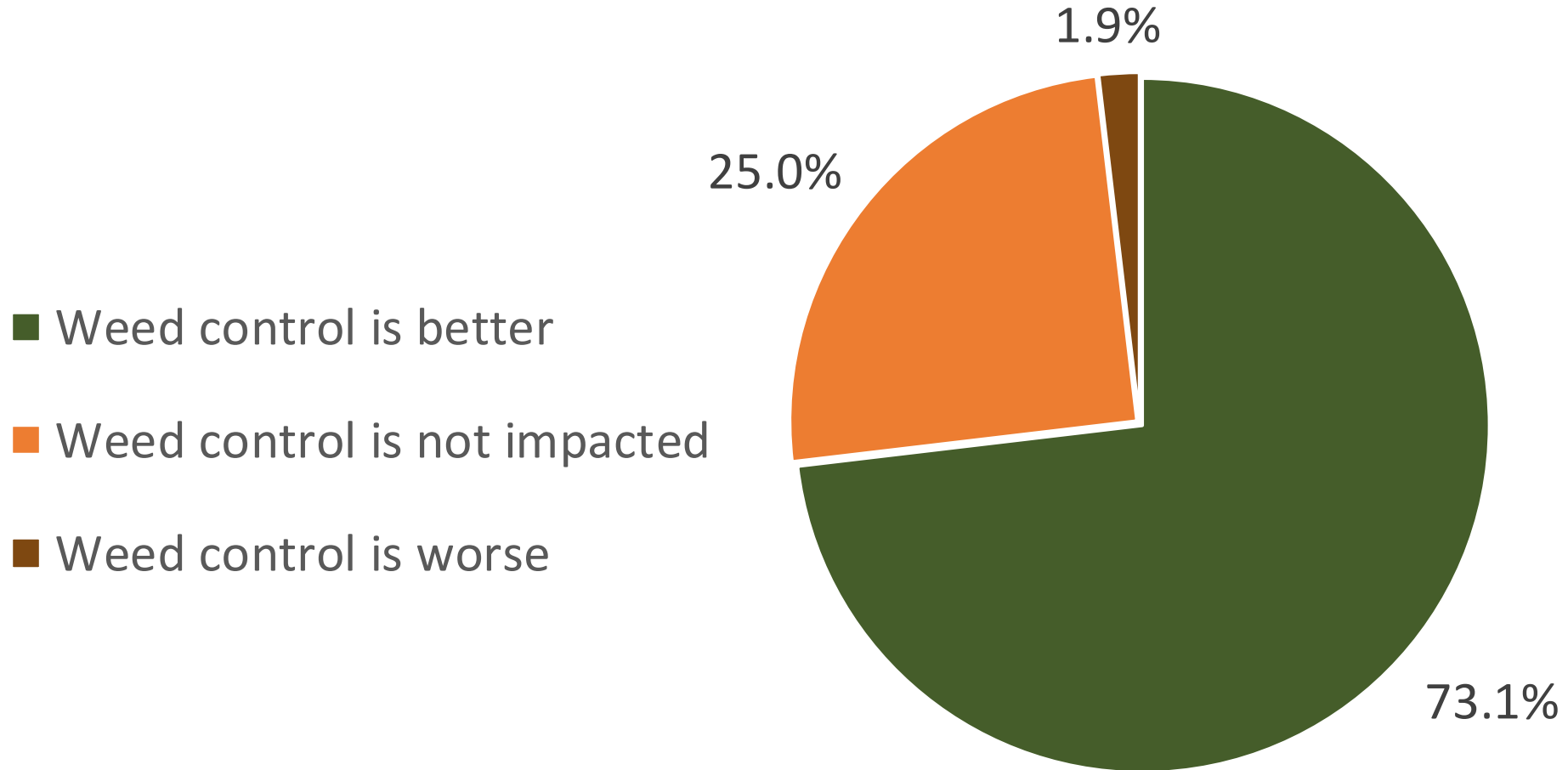
Farmer responses from 2022-23 SARE/CTIC National Cover Crop Survey

Nitrogen Application at Corn Planting



Farmer responses from 2022-23 SARE/CTIC National Cover Crop Survey

Weed Control Effectiveness Among Corn Farmers With No Change in Cost



Farmer responses from 2022-23 SARE/CTIC National Cover Crop Survey

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Potential “Green Bridge” Pest Issues

Green Bridge Hypothesis

- Do cover crops make certain insects and diseases worse on seedling cash crops?
- Does planting green increase the risk of these pests?
- Is scouting and spraying needed?
- Factors:
 - Weather conditions
 - Specific insect or disease
 - Timing of termination



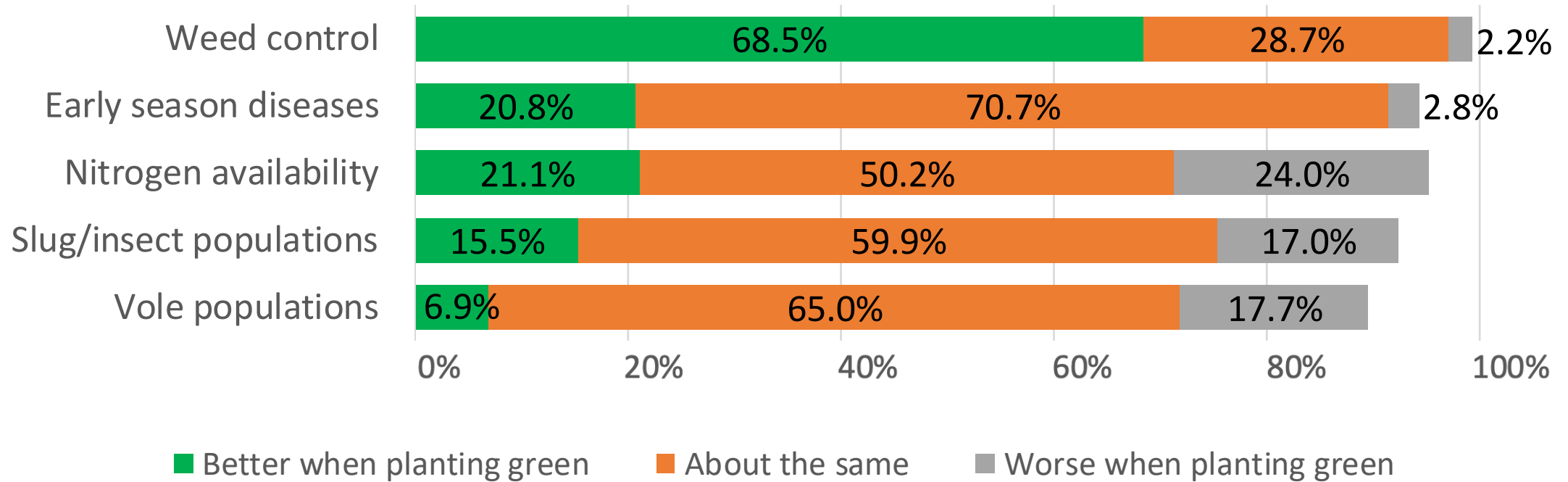
Other Potential Pests in Heavy Residue

- Voles
- Slugs



Farmer Experiences


Impacts of Planting Green



A field of red clover cover crops, showing numerous upright stems with dense, bright red flower heads. The plants are growing in a field, with green leaves visible at the base of the stems. The background is slightly blurred, emphasizing the foreground plants.

Impact of Cover Crops on Soil Moisture

Do cover crops help or hurt yields in dry summers?



Crop Year	Corn	Soybeans
2012	9.6%	11.6%
2013	3.1%	4.3%
2014	2.1%	4.2%
2015	1.9%	2.8%
2016	1.3%	3.8%
2019	2.0%	5.0%
2022	0.5%	3.6%

Data provided from hundreds of farmers annually in the SARE/CTIC national cover crop survey. Yield differences are statistically significant each year except for corn in 2022, which was not statistically different.

#1. Cover crops increase rainfall infiltration



Cover crop roots and increased earthworm activity open up more macropores



Photo courtesy of SARE

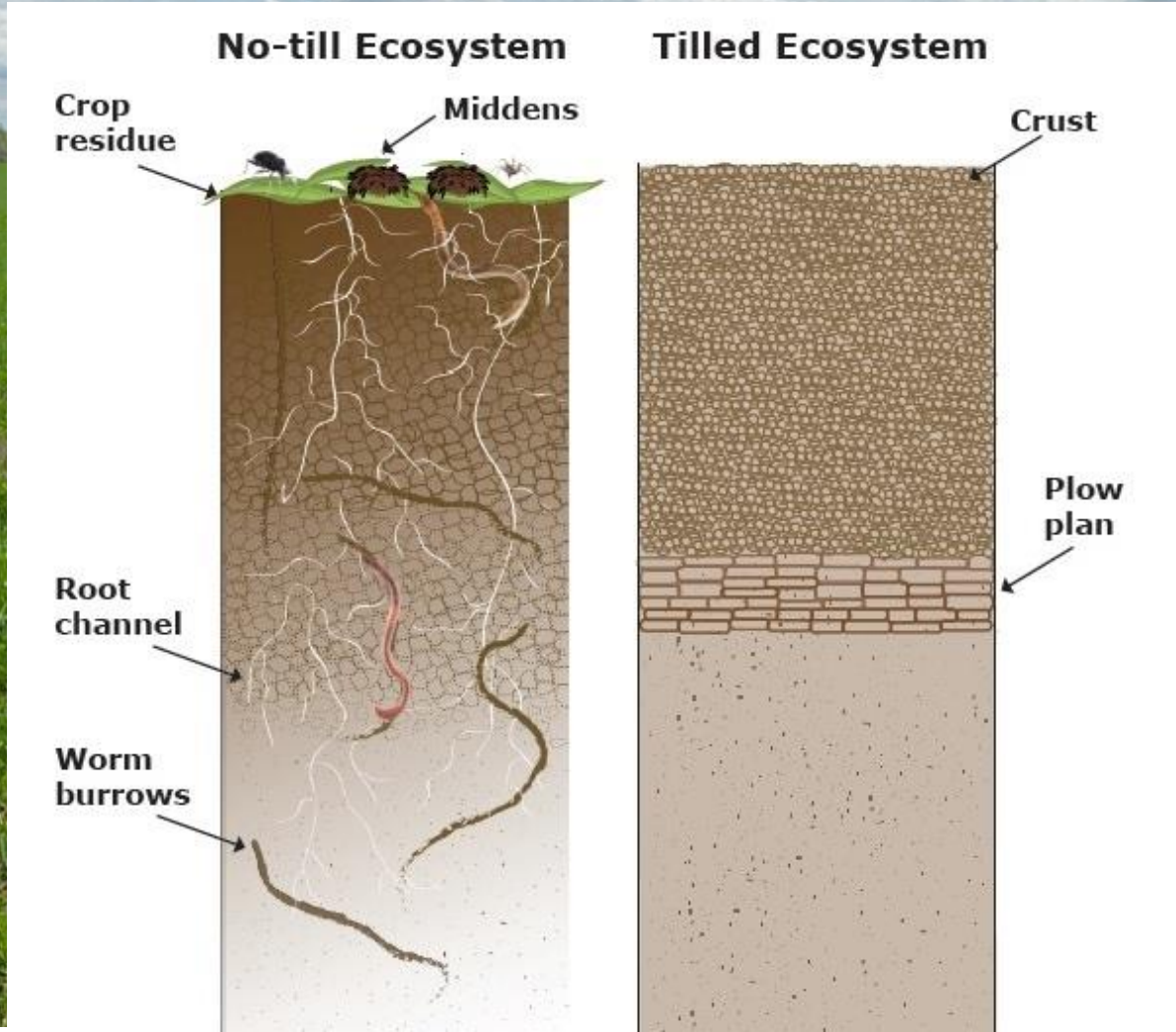


Photo credit –
Edwin Remsburg

#2. Cover crops increase water holding capacity of the soil



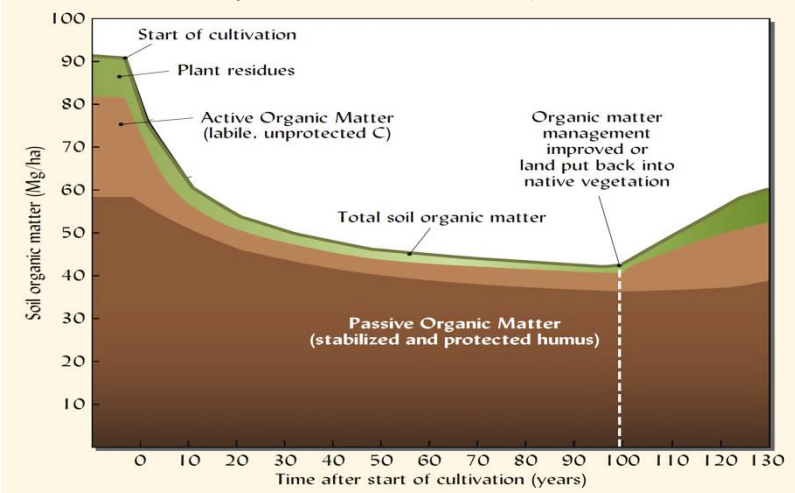
Brick = high bulk density,
low pore space



Sponge = low bulk density,
high pore space

wmearthcare.com

From: Weil and Brady. 2017. *The Nature and Properties of Soils*. 15th edition



www.smarthacks.tv

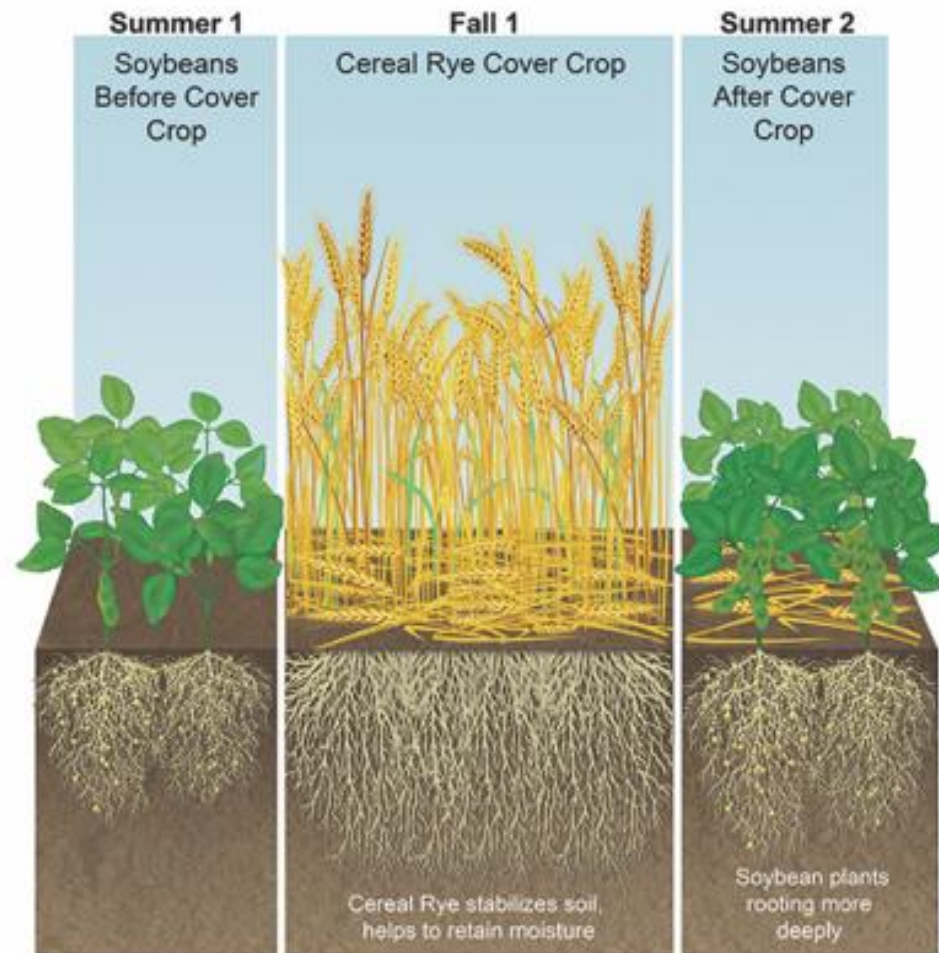


Photo credit: Russ Jackson

#3. Cover crop residue reduces soil moisture evaporation and keeps soil cooler



#4. Cover crops can increase the rooting depth of the cash crop



#5. Cover crops reduce compaction

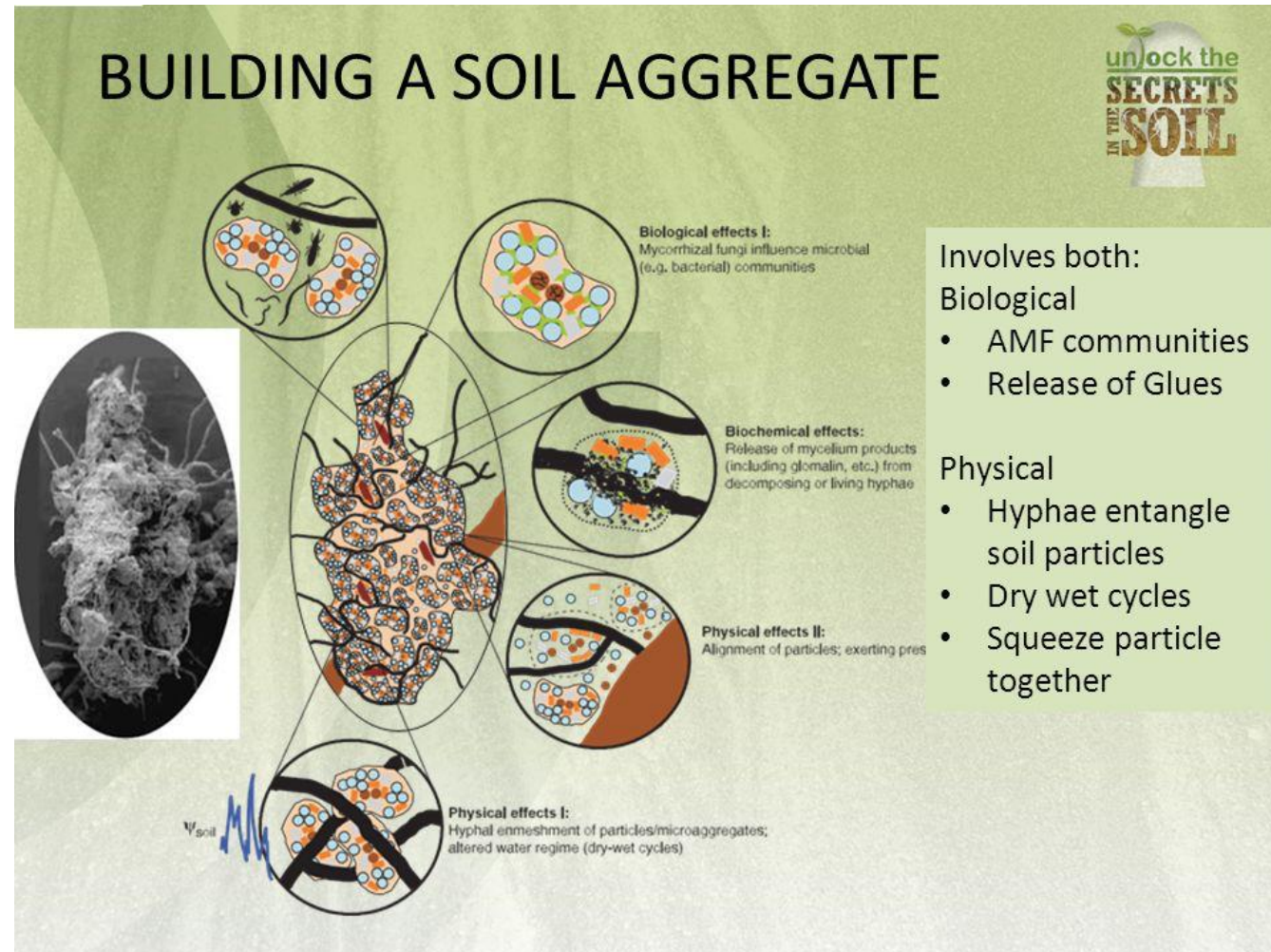


Corn and Soybean Digest

Ohio studies showed cover crops compared favorably to subsoiling

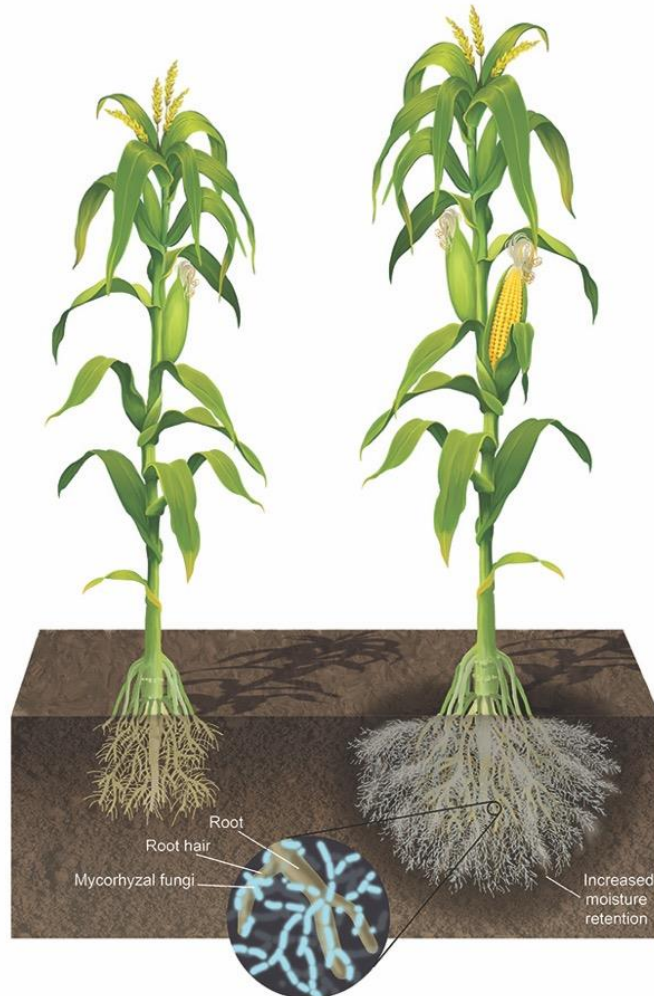


Compaction reduced by better aggregate structure in the soil



#6. Cover crops increase mycorrhizal fungi

Extension of Corn Root Surface Area through Mycorrhizal Fungi



Mycorrhizal fungi trade water and nutrients to the crop in exchange for carbohydrate exudates from the crop roots

#7. Cover crops can increase beneficial insects and through healthier soil reduce pest stress



Photo: Nancy Adams

#8. Cover crops help manage weeds





Photo credit - Cory Ritter

Summary: 7 Tips on Planting Green

Planting green can be an effective strategy to maximize cover crop benefits, including weed control, but ease into it with one or two fields and act on the following:

- 1) Monitor soil moisture conditions and upcoming weather forecast
- 2) Adjust nutrient management, especially if corn into a cover crop like cereal rye
- 3) Be prepared to modify planter settings, possibly removing coulter, changing closing wheels, adjusting or removing residue (trash) cleaners
- 4) Focus on getting the furrow closed
- 5) Spray and/or roller crimp shortly after planting
- 5) Consider delaying application of certain residual herbicides
- 6) Scout for insects or other emergence issues
- 7) Talk to other farmers in your region who have planted green

