



ORGANIC WEED MANAGEMENT

Practices & Tools To Bring
Profitable Results To Your Farm



WITH ORGANIC, FARMERS PROSPER

As the old saying goes, “Don’t put all your eggs in one basket.” If you’re considering diversification as a way to gain more profit potential for your farm, growing organic crops might be a good option for you for 3 reasons..

1. Opportunity for increased profit potential per acre.

“From the proof I’ve seen so far, there’s no difference in yield between organic and conventional crops, and the price of conventional corn is around \$4 while the price of organic corn is \$8.50 to \$9.00, so it’s 100% better in profit and about the same yield.”

-- *Chuck Thompson, Humboldt, Iowa*

2. Organic farming methods can help preserve soil.

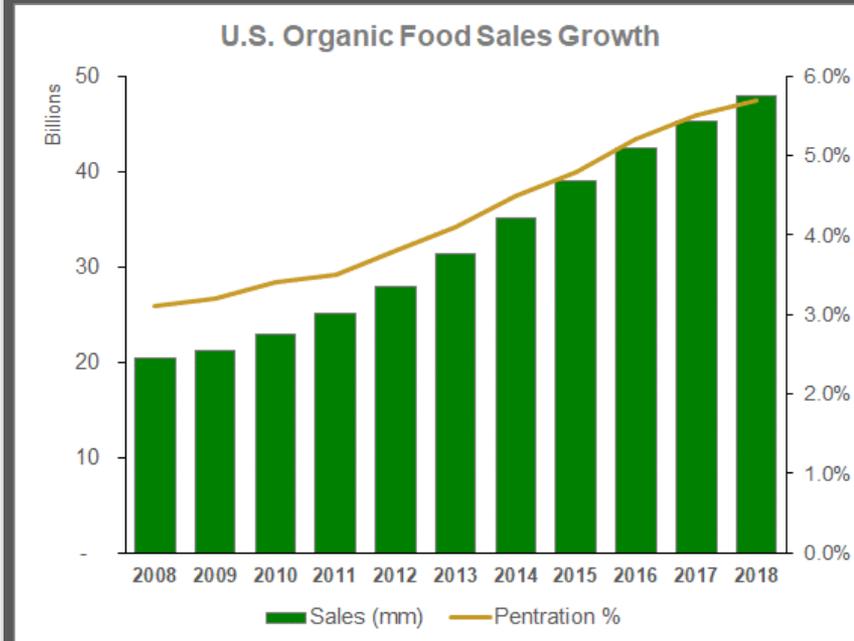
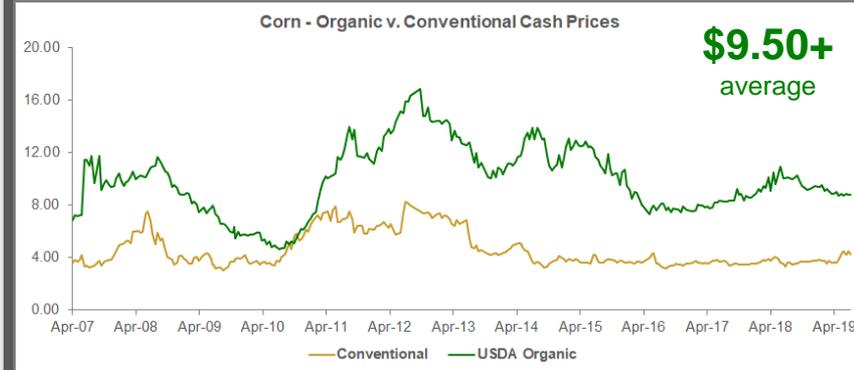
“We’re going back to farming like we did several years ago. We’re tilling the organic ground and using cover crops to help with weed issues, but we’re also using fewer chemicals.”

-- *Brian Irlbeck, Manning, Iowa*

3. The market outlook for organic crops is exciting.

The demand for organic products continues to rise. In 2018, organic sales in the United States totaled approximately \$48 billion, reflecting increased sales of 5.9 percent (or \$2.8 billion) from the previous year. Since 2000, it’s an increase of 350 percent.¹

1. Organic Trade Association press release.



WEED MANAGEMENT: BARRIER OR OPPORTUNITY?

If you're new to organic production, or are considering it, *one of your biggest concerns is probably weed control.* Without the use of herbicides, you may be wondering whether weed control is even possible.

While it does take a higher level of management, weed control in organic systems is possible with the right plan, tools and support. Additionally, many of its practices are synergistic with soil health – leading to yields approaching conventional crop production.

Concern over weed control has limited farmer adoption and a key driven why the U.S. does not produce enough organic corn or soybeans to meet domestic demand. Ultimately, this provides an real opportunity for those willing to learn and embrace new management practices.

This guide provides AgriSecure's perspective on critical weed management principles and tools – which can be your first step to considering organic production for your farm.



WHAT'S INCLUDED IN THE GUIDE?

Weed Management In Organic Production

- Five Principles for Success
- Weed Control Tools
- Innovative Ag Tech Solutions

Effective organic weed management is possible – with the right plan, tools, and support!



WEED MANAGEMENT PRINCIPLES

Successful organic production requires the thoughtful plan starting with a long-term crop rotation and ending with proactive execution throughout the crop year. This section will cover the following 5 principles of weed management.

- 1 Start with Planning & Management
- 2 Crop Rotation + Cover Crops
- 3 Soil Health Matters
- 4 Use a Tillage Toolbox
- 5 Let ROI Be Your Guide

1 PLANNING & MANAGEMENT

Build & Execute a Proactive Planning

Building and executing a proactive plan to work the field from before planting through canopy to make sure weeds cannot take hold is critical.

Staying ahead of the game often means only minimal soil disturbance is required, which is AgriSecure's goal. Doing so requires closely monitoring weather so you can accomplish the needed tillage prior to canopy.

Ensure Sufficient Time for Management

The simplest and biggest mistake you can make with weed control in organic systems is to fall behind. Once you get behind, it can be *really* hard to catch up. As such, having a [detailed field plan in place](#), including the time and flexibility to be in the field every 3 to 5 days for a cultivation pass, is not only wise but also necessary.

The screenshot displays the AgriSecure Field Plans interface. At the top, there are navigation links for Operations, Analysis, Reports, and Knowledge Center. Below this, the 'Field Plans' section is active, showing filters for Field (Atlantic 1), Crop Name (Organic Corn), and Acres (63). A search button is present. The main content area shows a 'Work Orders' table for field 1597, with filters for Crop Year (CY 2019) and Crop Plan (Organic Corn). The table has columns for ID, Crop, Scenario, Date, Activity, Cost, \$ / Acre, and Products. The data rows are as follows:

ID	Crop	Scenario	Date	Activity	Cost	\$ / Acre	Products
109226	Organic Corn	Actual	1/1/2019	Organic Paperwork	\$3,000	\$25.00	
90580	Organic Corn	Actual	4/14/2019	Soild Manure Spreading	\$2,520	\$40.00	Chicken Manure
90591	Organic Corn	Actual	4/15/2019	Discing	\$945	\$15.00	
101393	Organic Corn	Actual	4/15/2019	Dry Spreading <500#/acre	\$315	\$5.00	Calcium Sulfate
105490	Organic Corn	Actual	5/5/2019	Discing	\$945	\$15.00	
105491	Organic Corn	Actual	5/16/2019	Field Conditioning	\$945	\$15.00	
105492	Organic Corn	Actual	5/17/2019	Planting Corn	\$1,260	\$20.00	Great Harvest 55E 55g3, Seitec 6215
75063	Organic Corn	Budget	5/17/2019	Tine Weeder	\$1,800	\$15.00	
75062	Organic Corn	Budget	5/25/2019	Tine Weeder	\$1,680	\$14.00	
109227	Organic Corn	Actual	6/6/2019	Cultivating	\$1,440	\$12.00	
109228	Organic Corn	Actual	6/20/2019	Cultivating	\$1,440	\$12.00	
73943	Organic Corn	Budget	9/1/2019	Crop Insurance	\$4,200	\$35.00	
73933	Organic Corn	Budget	10/1/2019	Combining Corn	\$4,200	\$35.00	
73941	Organic Corn	Budget	10/20/2019	Harvest Charge	\$0	\$0.00	Truck Hauling

AgriSecure's MyFarm Platform Builds Detailed Field Plans

2 CROP ROTATIONS + COVER CROPS



Crop Rotation

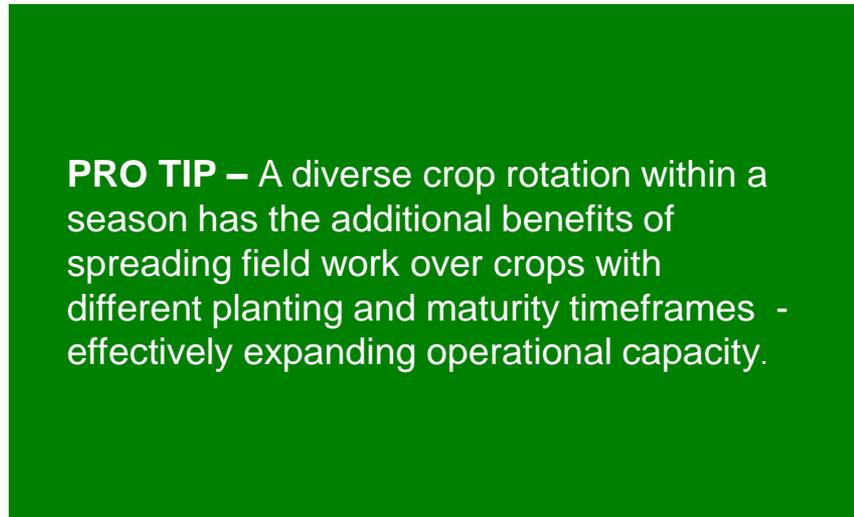
A long-term crop rotation should focus on:

- minimizing the weed seed bank,
- building soil health, and
- mitigating the opportunity for weeds to persist.

Typical corn-soybean rotations can prove challenging as both crops have similar planting and harvesting cycles, which does not disrupt the weed cycle.

Incorporating small grains is a option to consider as planting early will keep the ground covered, harvest occurs before weeds go to seed, and an early seeded cover crop can be used.

Ultimately, crop rotations with different harvest periods and cover crops help disrupt the normal weed cycle.



2 CROP ROTATIONS + COVER CROPS

Cover Crops

Getting a good start on weed control begins the fall before. In organic systems, this means leveraging cover crops to minimize opportunities for weed pressure to develop, and capture other agronomic benefits.

A few things to consider:

- Certain cover crops, or cover crop mixes, will help build nitrogen and soil organic matter, as well as year-round biological activity.
- Oats scavenge nitrogen in the top 2" of the soil, which alone can help hold weeds back until a your primary tillage to incorporate it as a green manure
- [Allelopathic](#) species, such as cereal rye, will create a toxin in the soil, that hinders the germination of weeds

Cereal rye, oats, radishes, clover, and field peas are all species you can utilize as cover crops



3 SOIL HEALTH MATTERS

First Line of Defense

Healthy soils support healthy crops, which are able to resist disease and stress, and minimize opportunities for weeds

Soil Health in Organic

- Improving soil biology through diverse rotations
- Balancing soil pH
- Increasing tillage to allow aeration will help control weeds
- Building nitrogen through plant fixation, as well as making key nutrients bioavailable

Ultimately soil health will decrease weed pressure, reduce fertility expenses, minimize disease/pests and optimize management effort

PRO TIP: Keeping your soil pH balanced as some weeds prefer more acidic or basic soils. Correcting pH, similar to conventional, by applying naturally mined ag lime or gypsum.



4 THE TILLAGE TOOLBOX

Tillage Tools

Tillage is the primary defense mechanism throughout the season – a few key tips are:

- Prior to planting, it is important to get the soil bed as level as possible so early forms of tillage can have good soil contact to eliminate germinating weeds
- Plan on performing some form of tillage every 3-5 days from planting through canopy
- If you can see weeds, you need to change plans – being proactive, preventative, and aggressive is key
- Consider increasing planting populations to compensate for the many tillage passes

Mechanical weed management tools are improving each year and remain reasonably priced. However, you must assess if you have both the tools and capacity to get the job done right.



5 LET RETURNS (NOT EMOTIONS) GUIDE YOUR DECISIONS

Organic price premiums provide the opportunity for extraordinary profit, so let return on investment (ROI) drive your weed management decisions.

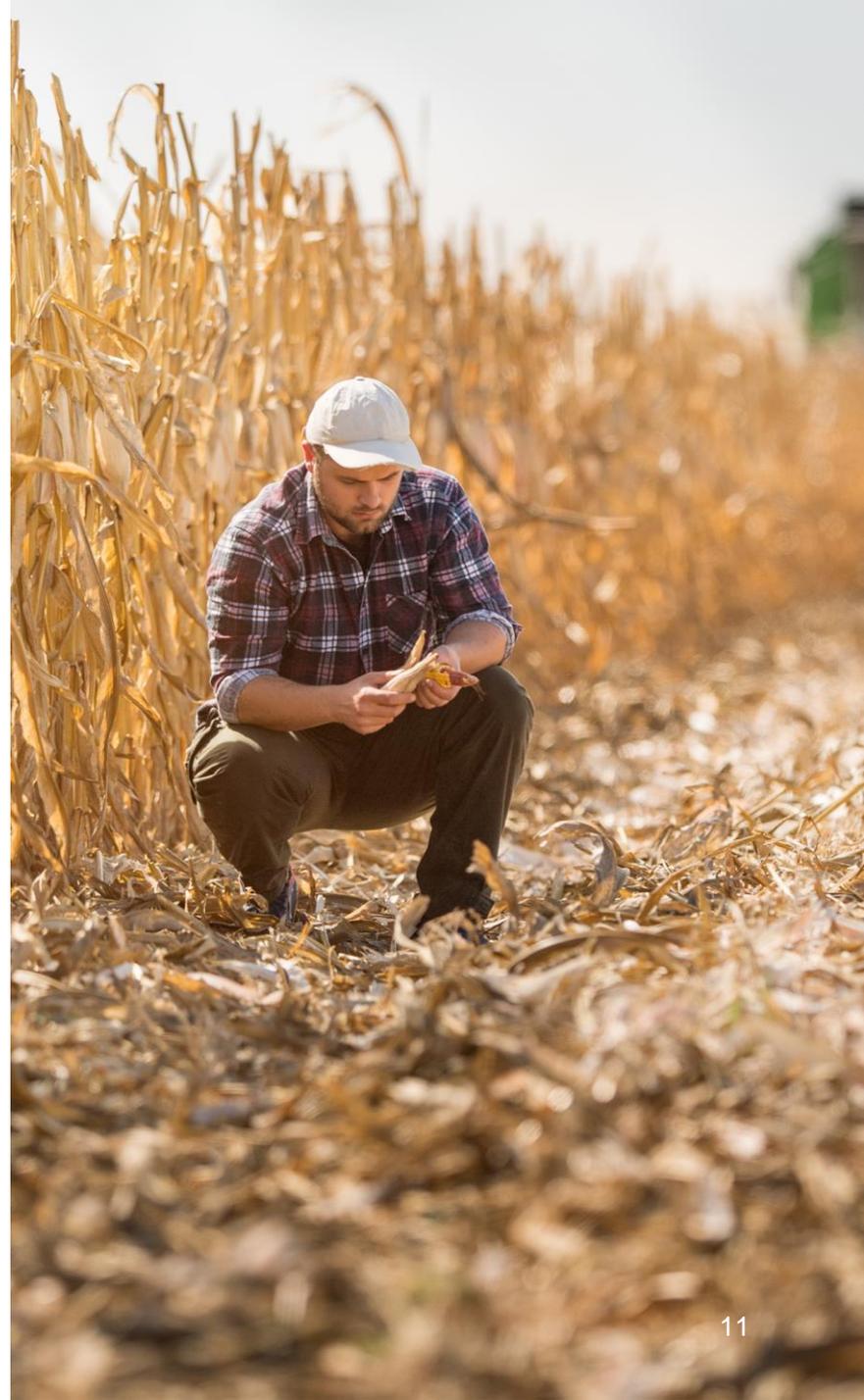
Examples of Decisions

- Delaying planting based upon weather – it may take the top off of yield but ensure you have the field work capacity at the required time
- Evaluating the expense of walkers for soybeans vs. having to look at a field with weeds
- Spending a few extra \$'s to get the right equipment



“I had been farming organic for a few years before joining AgriSecure. Their system and support has helped me get a plan in place and stay ahead of things in a way I could not have done on my own.”

Billy Rucker
Clovis, New Mexico



WEED CONTROL TOOLS: ROTARY HOE

A key preventative tillage tool – it's purpose is to remove weeds from non-visible state up to the white root hair state; from post-planting to early stages of standing crop.

- Ensure all wheels are free flowing and not worn – if not, replace bearings
- Speed is your friend. Optimum run speed is 11-15 mph to create the most disturbance to the soil
- Check periodically that wheels are free spinning
- Alternate directions in the field every time you perform a rotary hoe pass
- In a standing crop there will be some leaf matter destruction, which will feel uncomfortable, but the more aggressive the tillage the better
- Stop using once plant root base can effectively with adequate soil (2"-3") during cultivation



Rotary Hoe



Rotary Hoe on Emerging Soybeans

WEED CONTROL TOOLS: TINE WEEDER

Removes non-visible or just emerging weeds, and offers a bit more flexibility compared to the rotary hoe.

Designed to be used post-planting through the early stages of standing crop. Stop using once plant root base can effectively with adequate soil (2"-3") during cultivation.

- Set up is more of an art than a science
- Most effective with loose soil (not cloddy) – do a rotary hoe pass first, if needed
- Pre-emergence travel at speeds of 10mph and above; however, when crops have emerged travel at 2-4 mph
- If field has heavy debris (corn stalks, cobs, etc.) stop every few rounds and clear off tines
- Alternate directions in the field with each pass
- In a standing crop there will be some leaf matter destruction, which will feel uncomfortable, but the more aggressive the tillage the better



Tine Weeder

WEED CONTROL TOOLS: IN-ROW CULTIVATOR

Used for both early and later crop growth stages.

- Variety of features such as side shields, barring off discs, hillers, and various footprints of the sweep – each can be effective if used right
- Achieve the widest footprint with the highest speed you can travel by finding the breakpoint speed (i.e. plants are consistently covered by soil) and backing off slightly
- Side shields are effective, but generally leave a 2-3” band on the side of the crop without soil disturbance, which is prime for weeds. It is recommended to interlace passes with a rotary hoe or tine weeder
- The first pass with an in-row cultivator should loosen the soil, while the next should throw soil towards the plant root base. As the season progresses, so should the aggressiveness of your cultivation
- When confident there is not a flush of weeds at the root base and you can cover it with 2”-3” of soil near the root base, then graduate to cultivation passes only every 7-10 days



WEED CONTROL TOOLS: WEED BURNER

Technically does not burn the weeds, but heats the cell walls to cause internal “bleeding” so weeds dry up & die.

- Can be set up as a broadcast, where it does the whole stand, or can be banded to target weeds only
- Similar to herbicides, the bigger the weeds the more propane you’ll need - Speed, flame angle, pressure, and amount are all important
- More effective on broadleaves (vs. grass), with broadleaf weeds early (1-3”)
- Especially effective during wet seasons
- Assess damage with fingerprint test
- Cultivate shortly after weed burning, if possible



12-Row Flamer with Hoods



Fingerprint Test to Verify Tissue Died Post Burning

WEED CONTROL TOOLS: WALKERS

Hiring Process

- Review expectations prior to starting and be ready to negotiate a fee per acre or fee per hour
- Prior to starting, review daily start and end times and break schedule (paid or unpaid)
- Ask for references of prior customers

Management

- Hire early as small sized weeds are the easiest to remove
- Be present during the process and inspect fields to ensure satisfactory results
- Break up large groups of walkers into smaller sets of 7-10 to help ensure better progress
- Flag fields with special requirements
- Cultivate aggressively post walking



Walkers in a Bean Field

INNOVATIVE AGTECH SOLUTIONS

The future of organics is becoming even brighter as new Ag Technologies addressing key challenges – including weed management – come to market. Benefits will largely help deliver success in two dimensions:

Improving Decision Making

The application of data driven AgTech will be similar to conventional; however, the return can be significantly greater give organic premiums. Capturing field and farm data will help deliver the level of precision and data required to uncover new insights and inform better decisions.

Enhancing Execution

Standard technology options, such as precision planting, also apply to organic. However, new technologies may gain traction in organics (such as weed zappers and robotics) first as price premiums will drive higher ROIs for innovative solutions.



Optical Guidance Units – Reduce Operator Fatigue



Robotics – Potential Future for Mechanical Weed Control



Weed Zappers – New Alternative for Established Weeds

AGRISECURE HELPS FARMERS TACKLE THE CHALLENGES OF ORGANIC PRODUCTION

Over the past 10 years, AgriSecure's farmer founders have developed the knowledge and system to succeed with large-scale organic row crop production.

The *AgriSecure Organic Farm Management Platform* delivers the expertise, systems and support to tackle the challenges of large-scale organic production.



"Organic presented a huge opportunity for our family farm. However, I'm not sure if a farm can get all of the knowledge required to do it right by themselves. Being a part of the AgriSecure network has been an invaluable asset."

Keith Bowden
Alden, Iowa



Organic Expertise & Innovation

World-class knowledge training, coaching, and best practices



Farm Planning & Execution

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Certification Support

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