

## Farm Decision Making:

A farmer is a dedicated caretaker and steward of the land, committed to growing productive and profitable crops. Striking this balance demands a wide array of skills, from utilizing various tools to maintaining a sharp awareness of environmental conditions, coupled with practical knowledge and extensive experience. Throughout the year, farmers make crucial decisions that often carry significant financial implications, potentially involving hundreds of thousands - or even millions - of dollars. These decisions can mean the difference between profit and loss. For industry representatives, understanding the timing and complexity of these decisions is essential, as they often involve multi-year transitions and substantial investments. Numerous factors, including market fluctuations, weather conditions, and family dynamics, can influence outcomes, necessitating strategic adjustments. Recognizing this complexity fosters greater empathy and insight, enabling more effective engagement and support for farmers.





## Resource Overview:

This resource aims to highlight the **key decisions a traditional/ conventional farmer makes throughout the year**. While not an exhaustive list, it provides an overview of critical time frames in the agrarian calendar, offering basic start and stop points for the various seasons within the agrarian framework. If you are interested in learning more about farm decision making through a regenerative farmers lens, ranchers lens, or for producers in a specific region, check out our services by visiting [Living Roots Ag](#) today.

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## Terminology and Context:

The **agrarian calendar**, in this context, refers to the cycle of crop production on a farm from the end of harvest last year to the last day of harvest this year. It encompasses multiple seasons where tasks and management decisions vary according to the growth cycle of the crops being grown. Although it operates independently of the livestock production calendar, there are many similarities and overlaps between the two.

In most of the U.S., a **farmer** is a steward and caretaker of the soil and crops (such as grains, vegetables, and nuts) within the context of a field. Farmers actively manage the process of photosynthesis to produce healthy and profitable crops. In contrast, a **rancher** is a caretaker of livestock within pastures and/or feeding operations, managing the welfare of their animals to produce high-quality meat. This [POST from the Texas Farm Bureau](#) provides a good overview of the differences between farming and ranching. Pork, dairy and egg producers can often be discussed interchangeably as farmers or ranchers, depending on the context of their operation.



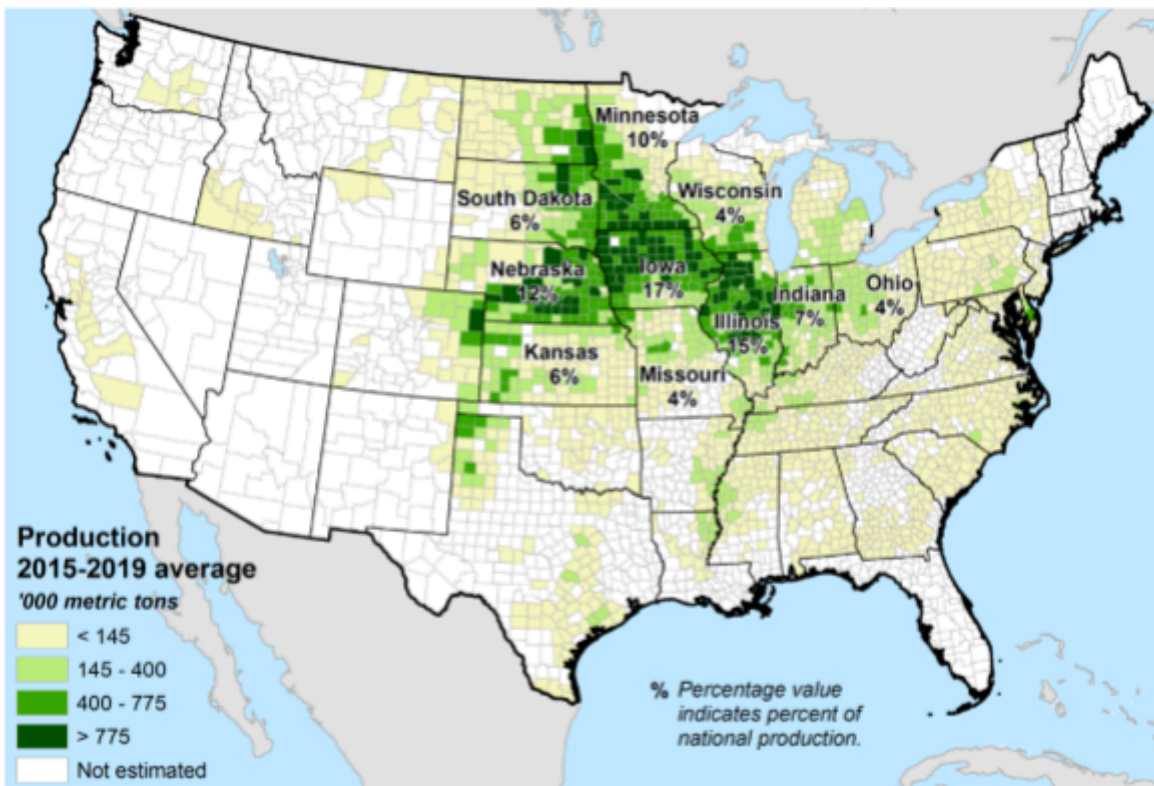
The terms "grower" and "producer" are interchangeable and can describe both farmers and ranchers. If your company offers services or products used by both farmers and ranchers, it is often in your best interest to use these interchangeable terms when creating copy, collateral, or communicating with customers. Understanding the differences between these terms and when to use them will increase your credibility with your audience. This resource will solely focus on farmers and their decision making. Stay tuned for a livestock and ranching decision making guide in the near future.

For reference, you will find a long list of ADDITIONAL TERMINOLOGY below under the Summary and Resources section.

## Major Production Regions:

In the United States and Canada, crop cultivation is primarily determined by climate, water availability, and the adaptability of crops to these factors. Although climate and water availability are closely related, they are often discussed separately due to the presence of irrigated regions in certain parts of North America.

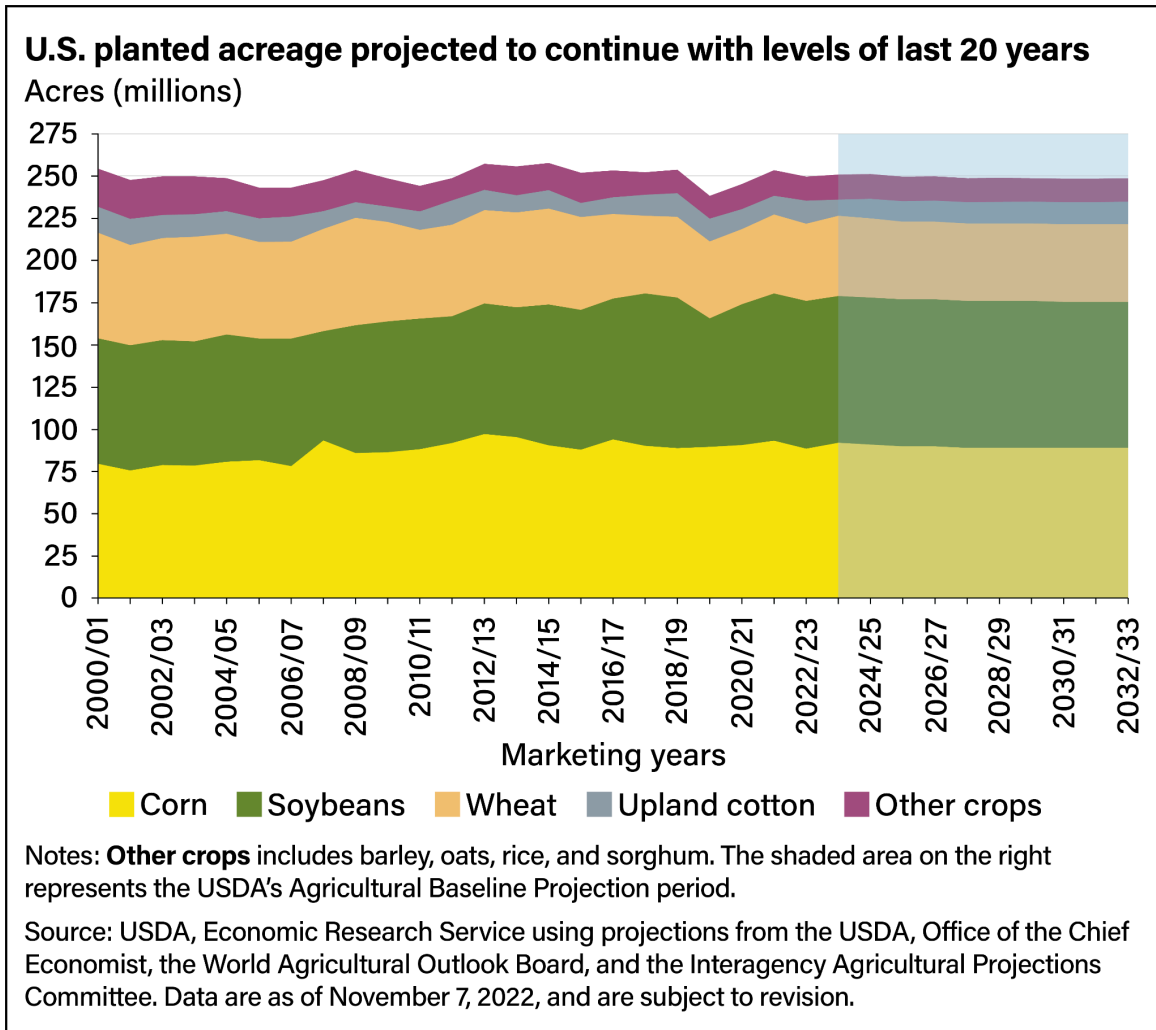
The United States Department of Agriculture (USDA) provides county-level maps ([LINK HERE](#)) that display the approximate acreage of various row crops, as illustrated for corn in Figure 1 below.





**Figure 1.** Corn production by county in the U.S.

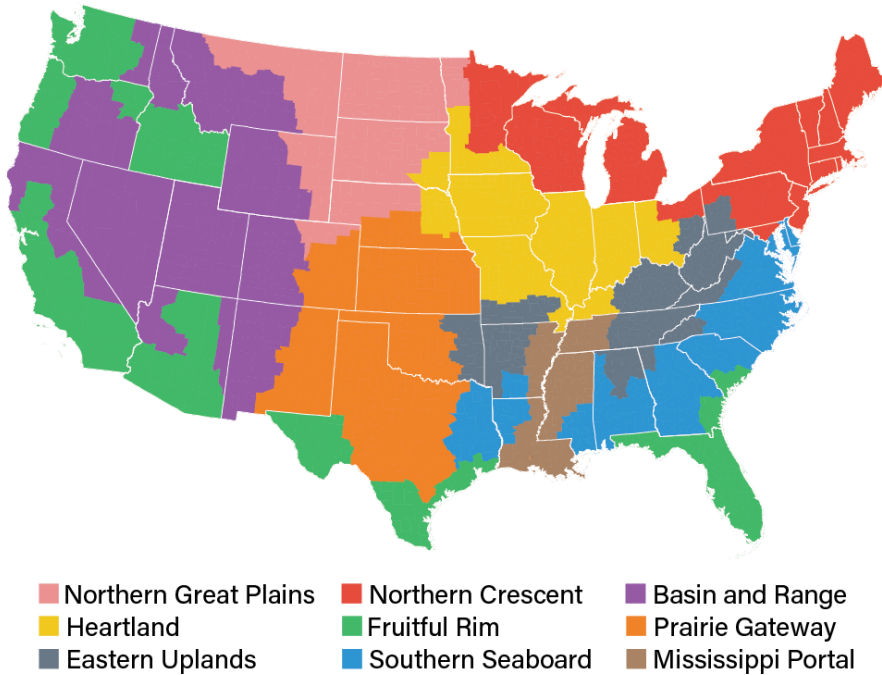
The link above will take you to the USDA Crop Production Map homepage, where you can access production maps for 15 different types of row crops and visually observe trends in major production regions across the U.S. Figure 2 shows total acreage trends across the U.S for major row crops.



**Figure 2:** [USDA historical and future outlook](#) on major row crop acreage trends for the entire U.S.

For a broader perspective, the USDA has also identified nine farm resource regions, where production practices and crops grown are similar across extensive geographical areas. Figure 3 below shows these resource regions.

**USDA, Economic Research Service groups its nine Farm Resource Regions according to geographical commodity specializations**



Source: USDA, Economic Research Service Farm Resource Regions

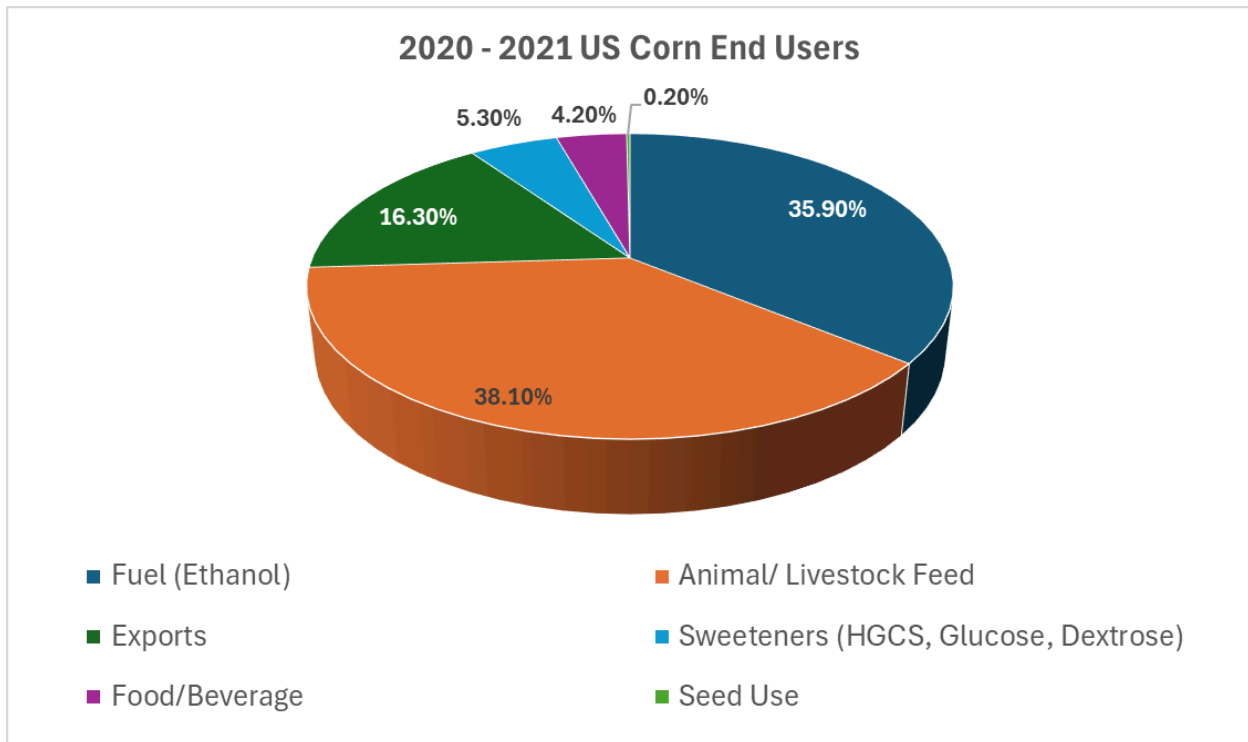
**Figure 3.** This map displays USDA-defined resource regions, where commodity specializations are similar across large geographical areas.

If you're interested in more detailed context on how these regions are further subdivided, check out [THIS LINK](#) for definitions of USDA Land Resource Regions (LRR) and Major Land Resource Associations (MLRA). LRR and

[MLRA](#) boundaries are frequently used in planning, funding, policy-making, sustainability efforts, and various other decisions.

## End Users/ Consumers:

The end user or consumer for many grain crops may not be who you expect. Many of these grains are not used for direct human consumption. Instead, they are often used for fuel, fiber, livestock feed, export into foreign markets (for similar uses as previously described), or processed to be used as ingredients in food for human consumption (high fructose corn syrup). For example, the Center for Integrated Agricultural Systems at the University of Wisconsin created the following visual ([Figure 4](#)) to show major end users of corn in the U.S.



**Figure 4.** Corn end users by major consumers. (If you're wondering why sweet corn for human consumption is not included in this display, here's the explanation: Sweet corn differs from its close relative, field corn. Out of the approximately 87 to 95 million acres of corn grown annually in the U.S., only about 250,000 acres are dedicated to sweet corn. The remaining acreage is used for field corn.)

A better visual graphic showing corn utilization can be found at the [visual capitalist](#). In addition, the USDA has a high level overview of the grains feed sector which discusses users of major row crops found [HERE](#).

One final thing to note is that unless the grain is going from the farm to an end user, the farmer may not even know who the end consumer is. Grain can exchange hands 3 - 4 times or more before reaching its final destination in many cases. This is because many farmers work with centralized cooperatives. These Cooperatives serve as a primary location for growers to buy inputs, sell grain, and contract various services. The Cooperative will store grain in large quantities and use this competitive advantage to market for higher prices to end users or the next handler.

## Production Windows:

The agrarian calendar can be divided into **six primary production windows** (Figure 5.). These windows depict the primary focus of growers at different times of the year. Slight deviations in these windows occur from south to north across the continental U.S.



**Figure 5** shows the six major production windows in the agrarian calendar for conventional farmers in the U.S. and Canada growing spring/ summer crops. Production windows for winter crops will look quite different.

Interested in learning more about crop planting and harvest dates?

The USDA has compiled [typical planting and harvest windows](#) for all major field crops in the U.S. The data is broken down by crop, crop usage (e.g., corn for grain versus corn silage), and



state. Although the report is from 2010, typical planting and harvest dates do not change much over time. Any acreage reported in this document will not be relevant for the current production.

If you are interested in the most recent acreage reports, use [THIS LINK](#) and navigate to the desired year. I suggest using the latest report for a given year. For example, if I wanted the most accurate 2023 data, I would click on the [2023 acreage data as of January 2, 2024](#) since it contains the final numbers.

Production windows for conventional and regenerative farmers growing spring and summer crops are largely the same. **The actual decisions being made and activities conducted can and do vary significantly.** Want to dive deeper into the unique decisions regenerative farmers face? Curious about how nature-based solutions and sustainability efforts shape their strategies?

[Contact Living Roots](#) today to explore how these factors influence farmer decision-making and learn how you can better support their needs."

## Performance Evaluation and Planning:

The performance evaluation and planning window generally occurs during **December, January, and February**. During this time, growers evaluate last year's crop performance to inform decisions for the next crop production cycle. Many different **input decisions are made, and most are typically finalized before December 31st** to allocate as many operating expenses as possible to the previous tax year.

In addition to making input decisions, farmers will attend winter courses hosted by various groups, finish taxes before February 15th, market their grain, review agronomic data to make production







improvements, spend time with family, go hunting and more.

## Equipment Preparation:

In **March**, growers are in full equipment preparation mode, ensuring everything is fit and ready for planting season. They focus on routine maintenance, checking precision equipment, modifying equipment or adding new hardware, replacing parts, and eagerly anticipating fieldwork.

In addition, producers may also be purchasing last-minute inputs, applying fertilizer that was meant to be applied in the fall, preparing fields, or doing other early fieldwork.

*From the perspective of a conventional/ traditional farmer, **preparing the fields for planting generally means conducting tillage**. The following are reasons why farmers use tillage. (Please note that a regenerative farmer will typically have a different outlook and may or may not use tillage)*

1. *Manage crop residue (leftover remains) from last year's crop.*
2. *Kill weeds which compete for valuable resources such as water and nutrients.*
3. *Smooth and level the surface to improve germination and emergence of the cash crop that will be planted.*
4. *Incorporate/ bury recently applied fertilizer or manure to prevent the fertilizer/ manure from being lost through multiple mechanisms.*

*If you are interested in learning more about tillage equipment and economics, please use the following resources:*

1. [2017 Tillage Equipment Guide](#): *This is the most recent version and the terminology has changed slightly as well as some pictures and implements have been updated from the next version.*
2. [2006 Tillage Equipment Guide](#): *This older version has some terminology differences*
3. [Upper Midwest Tillage Guide](#): *This 2021 publication from the University of Minnesota and North Dakota State covers a broader approach to selecting tillage implements, guidance for reducing tillage, and tillage economics.*

In many cases, this window marks the beginning of the busy season, and growers' capacity to meet is limited.

When making sales during this window, be sure to **ask the grower WHEN they expect to plant**. This date will often align with the crop insurance initial planting dates, which can be accessed through most crop insurers (some companies include Farm Credit Services of America, Farm Bureau, Farmers Mutual Hail, Rain and Hail, and more). Knowing this date is essential! **To build trust and reliability, your product must be at the farm gate before**



planting begins, ideally before the initial crop insurance planting date as a safety net. An example of important crop insurance dates for several states, provided by Farm Credit Services of America, can be [FOUND HERE](#).

## Planting Season:

Planting season for spring cash crops such as corn, soybeans, cotton, rice, oats, spring wheat, spring barley, pulse crops, and other oilseeds primarily occurs in April and May. While there are slight deviations from south to north, most spring crops are planted during these months.

During this time frame, growers focus on fertilization, spring tillage, pre-emergent herbicides, and, most importantly, planting. **Many agronomists and farmers consider this the most critical window.**

The remaining windows will not matter if planting is not successful. Farmers will have **very limited capacity** to manage other aspects of the business, meet with advisors (except those who are most critical), take phone calls, read emails, or respond to voicemails. Their sole focus is to “get the crop in the ground” with as little struggle as possible. **Products, services, or offerings launched during this window will almost always fall on deaf ears** unless they solve an immediate and critical problem or challenge such as

equipment malfunction/ breakdown, software patch for guidance/ tracking systems, or agronomic guidance for a new product being tested.

Many sales representatives build bridges by meeting their customers in the field and can provide support by bringing snacks, meals, or even offering to lend a hand. These actions deepen the relationship and forge trust.

## In-season Management:

After planting, growers shift to in-season management activities from **June through July**.

These include, but are not limited to, post-emergent herbicide applications, in-season fertilization (side dressing or foliar), insecticide and/or fungicide applications, row cultivation,





irrigation management, and more. During this period, **producers generally have slightly more capacity to meet** with industry representatives, take phone calls, and respond to emails. However, **responses may still be slow** due to their many responsibilities.

Several resources can help you better understand local conditions before reaching out:

1. [U.S. Drought Monitor](#) - Helpful for knowing if a grower is concerned about rainfall and crop vitality.
2. [USDA Crop Progress Report](#) - Provides state level detail of crop conditions and crop growth progress.
3. [Purdue Ag Barometer](#) - Farm perceptions of the current agricultural economic outlook. This is a monthly report
4. Up to date Ag News - Primary audience is farmers
  - a. [Successful Farming](#)
  - b. [Ag Day](#)
  - c. [No-till farmer](#)
5. Local University Extension web pages - Find relevant information about local conditions within a state of interest.

If you are offering a product or service to address in-season challenges, **now may be the time to showcase your solution. However, be cautious and mindful of their time.** Although growers have more capacity compared to the planting window, their schedules are still demanding. It is advisable to **be strategic, keep appointments or calls short, and reinforce how your solution can address their specific challenges.** The 80/20 principle is your best friend: if 20% of your efforts deliver 80% of the value, focus on showcasing the 20% of your offerings that meet 80% of the farmer's needs.

Lastly, use the resources above to understand what your customers might be facing before reaching out.

## Harvest Preparations and Plot Days:

By the end of July, most in-season management activities are completed, and producers transition into harvest mode. They begin prepping equipment for the harvest of longer-season crops such as corn, soybeans, cotton, and peanuts, or start harvesting earlier planted crops such as oats, spring wheat, and spring barley. This window generally spans from **the last week of July through the first week of September.**

During this period, growers attend various field days, plot days, showcases, and industry events to learn and connect. You might be wondering, what exactly is a field or plot day? These events are outdoor showcases where companies selling equipment or inputs demonstrate the benefits of their products. Typically hosted in fields where the specific input or equipment has been used, these events focus on education while serving as vital sales opportunities. Growers have the



chance to see, touch, and experience firsthand how these products can address the challenges they face.

**Schedules are not as packed, making it a great opportunity to connect with potential customers, host a field day, or showcase your technology or solution at an event.**

Major events include:

1. [The Farm Progress Show](#)
2. [National Strip Tillage Conference](#)
3. [Husker Harvest Days](#)
4. [Minnesota Farm Fest](#)
5. [Midwest Ag Industries Exposition](#)
6. [Dealership Minds Summit](#)
7. [Empire Farm Days](#)
8. [Dakota Fest](#)
9. [Agronomy Conference and Expo](#)
10. [Agricultural Media Summit](#)
11. [Agribusiness Global Trade Summit](#)
12. Check local Extension calendars for additional events.

**Challenges growers have faced up to this point in the growing season are still top of mind.** If your product or solution can help overcome these challenges, growers will be more interested in what you have to offer. As mentioned earlier, take the time to understand what your prospective customers have been facing. Leverage the resource under “In-Season Management”, talk to growers in regions of interest, and connect with agronomists.

## Harvest and Post Harvest Fieldwork:

The final production window generally begins in **September and lasts until the end of November**. Growers focus on harvesting their crops, marketing grain, fall fertilizer applications, fall tillage, residue management, cleaning equipment, and more.

This window is busy, but not as strenuous as the planting window. Conditions are typically dry, giving farmers more time to harvest.

Although they may not have the capacity to meet with you in the shop, check emails routinely, take long phone calls, or read emails daily, **they are usually open to industry reps riding in the combine with them or taking short calls (5-10 minutes).**

For companies providing crop improvement inputs such as new crop varieties, seed treatments, biologicals, fertilizers, and more, riding in the combine is prime time to discuss ideal solutions for challenges a farmer has faced during the growing season. Farmers are actively recording or



taking notes on what went well and what did not, making **this a unique opportunity for candid conversations.**

However, be aware of changing weather conditions, breakdowns, and other factors a farmer may be facing. Doing so will help build their trust in you and the solution you are offering. Similar to the planting season, you can show you care by taking snacks or lunch out to the farm or offering to help.

## Summary and Resources:

Many decisions happen across the growing seasons. **Farmers wear many hats and require knowledge in many areas** such as agronomy, biology, mechanics, accounting, marketing, management, procurement, inventorying, record keeping, and the list goes on. **Knowing when these activities or decisions are happening is critical for the product life cycle of a service, product, or solution** your company may offer. At [Living Roots Ag](#) our services help align your product lifecycle to the agrarian calendar and discover barriers to adoption. Are you ready to take the next step in improving your product performance? Contact us today!

Table 2 below highlights the production windows, decisions being made, and insights on how to best work with growers.



Production Window	Duration	Major Decisions/ Activities	Capacity To Meet or talk	Capacity to Act	Products, Services, solutions to market	Influencer
<b>Performance Evaluation and Planning</b>	December - February	<ul style="list-style-type: none"> <li>a. Field performance/ data review</li> <li>b. Next crops needs</li> <li>c. Finances/ taxes</li> <li>d. Grain Marketing</li> <li>e. Updating records</li> <li>f. Government Program Enrollment</li> <li>g. Crop Insurance</li> <li>h. Equipment purchases</li> </ul>	<b>High</b> (Best Time)	High	Crop Inputs, Software Solutions, hardware, equipment and aftermarket solutions, services, tools	<ul style="list-style-type: none"> <li>Neighbors</li> <li>Grain Marketer</li> <li>Banker/ Lender</li> <li>Consultant</li> <li>NRCS Advisor</li> <li>Mechanic</li> <li>Agronomist</li> <li>Precision dealer</li> </ul>
<b>Equipment Preparation</b>	March	<ul style="list-style-type: none"> <li>a. Equipment maintenance/ repair</li> <li>b. Software updates/ hardware replacement</li> <li>c. Field planning</li> <li>d. Picking up inputs</li> <li>e. Hiring Labor</li> </ul>	Medium - Low	Medium	Crop inputs, Hardware upgrades, Precision software upgrades	<ul style="list-style-type: none"> <li>Mechanic</li> <li>Agronomist/ Consultant,</li> <li>Precision dealer</li> </ul>
<b>Planting Season</b>	April - May	<ul style="list-style-type: none"> <li>a. Spring fertilizer</li> <li>b. Spring tillage</li> <li>c. Pre-emergent Herbicides</li> <li>d. Planting</li> <li>e. Irrigation</li> <li>f. Scouting</li> </ul>	<b>Not advised</b>	Low/ negligible unless dire		<ul style="list-style-type: none"> <li>Agronomist/ Consultant,</li> <li>Mechanic,</li> <li><b>Neighbors*</b></li> </ul>



<b><i>In-season Management</i></b>	June - July	a. Post-emergent herbicides b. Scouting c. In-season fertilizer d. Maintaining crop health e. Fungicides/ Insecticides f. Marketing g. Irrigation	Low	Low - Medium	Foliar fertilizers, Fungicides, Insecticides, Tissue/ Sap test, Biologicals	Agronomist/ Consultant, Mechanic, <b>Neighbors</b> , Grain Marketer, Chemical Rep
<b><i>Harvest Preparation and Plot Days</i></b>	Last week of July - First Week of September	a. Equipment maintenance/ repair b. Marketing c. Attend plot days/ showcases d. Storage facility prep	High	Medium - High	Harvest aids, Equipment, Precision Hardware, Some Software	Precision Dealer
<b><i>Harvest and Post Harvest Fieldwork</i></b>	September - November	a. Harvest b. Fall tillage c. Fall fertilizer d. Marketing e. Soil Sampling	Low (harvest)  Medium (post harvest fieldwork)	Medium	Seed, Biologicals, Fall Fertilizer, Soil Sampling Services,	Grain Marketer <b>Neighbors</b> , Seed Dealer, Fertilizer Dealer

\*Neighbors: Growers are very relational and often share ideas, opinions, and advice. They influence each other by words and ACTIONS. The first person in the field each year often invokes a feeling of “hurry” or “now it’s go time” amongst his/her peers. They watch their neighbors closely to see what is new and what works or doesn’t work and are easily influenced by their neighboring farmers.

Do you need more specificity for a given product, service, or solution? Are you interested in learning more about a specific region, grower archetype, or crop? Do you understand how decision-making differs for a regenerative farmer compared to a conventional farmer? Knowing these nuances could be the difference between achieving product-market fit and experiencing poor performance. How much does missing a product launch date by one week cost in the context of the agrarian calendar? **Contact [Living Roots Ag](#) today and we will help your team unpack these critical insights!**



## What does Sustainability mean to a conventional farmer?

Sustainability has become a buzzword across many industries over the past two decades. Yet, if you ask five farmers what it means, you'll likely get five different answers. At its core, however, sustainability embodies a simple belief: the desire to pass the land on to the next generation. This goal doesn't necessarily hinge on specific practices, methodologies, or viewpoints; instead, it reflects a broader commitment to simply keep the farm for the next generation.

Unfortunately, the state of the land is often left to the next generation to decide its fate. The mounting pressures and tough decisions farmers face each year can make it seem impossible, irrelevant, or even counterproductive to adopt practices that academics and consumers consider climate-smart or sustainable. Despite the potential mid- to long-term benefits and improved profitability, the short-term risks prevent many growers from taking the plunge.

Take cover cropping, for example. While widely recognized as beneficial among farming and non-farming groups alike, the latest USDA Ag Census Survey found that only 4.7% of total cropland in 2022 was planted with cover crops. Not all land is suitable for cover cropping every year, but there is significant room for growth in this area.

### **You may be still wondering, why haven't more farmers adopted a practice like this?**

Many growers operate with razor-thin profit margins. A yield loss of just 2 - 5% from adopting sustainable practices like cover cropping can have a significant financial impact. For instance, with the national average corn yield at 177.3 bushels per acre in 2023, a 2 - 5% loss translates to 3.5 - 8.9 bushels per acre. At a corn price of \$4.50 per bushel, this represents a potential loss of \$15.75 - \$40.05 per acre. Multiplied across 1,000 acres, this could mean a loss of \$15,750 - \$40,500, a substantial hit that could wipe out a farmer's entire profit for the year.

This brings us back to the essence of sustainability. Most farmers likely share the desire to leave their land in better shape for the next generation, but the challenges of daily decision-making and financial risk often hinder progress. This presents an opportunity for various stakeholders to collaborate and find solutions that reduce farmers' risks, consider the complexities of the agrarian calendar, and increase the adoption of sustainable practices.

At Living Roots Ag, we have a proven track record of helping corporations, NGOs, policy groups, and others bring viable solutions to farmers. Contact us today to take the next step in advancing sustainability for your business or operation.





## Additional Terminology:

1. **Agronomist:** An advisor who deeply understands the interconnection between soils, crops, and the environment and uses this knowledge to help the farmer maximize crop production. There are many types of agronomists which include technical, sales, customer service, research, and more. Each has a different model for how they charge growers such as \$/acre, set fee for advice/guidance, sale of a product, \$/hour (least common), or others.
2. **Application:** An event where a farmer makes a trip across a field in order to add something to the soil or crop (examples include fertilizer and chemicals). An application can be accomplished by a tractor, sprayer, airplane, robot, drone, buggy, and more. Each tool is built to accomplish a specific task or multiple tasks.
3. **Biologicals:** Biologicals are products containing any living organisms (generally bacteria, protozoa, nematodes, and/or fungi) used to alleviate a problem in a field such as controlling pests, managing nutrient deficiencies, improving poor plant growth, or more.
4. **Center Pivot:** A center pivot is a long, wheeled pipe structure that distributes water through sprinklers at set intervals as it rotates in a circle around a central well, where the water is pumped from.
5. **Cooperatives:** A business owned and run by its members which typically sells seed, chemical, and fertilizer. This business also buys grain from farmers, provides agronomic services, and will custom apply various crop inputs.
6. **Crop Inputs:** A general term for all products (variable expenses) used to grow a crop. This includes seed, chemicals (pesticides), fertilizer, biologicals, etc.
7. **Crop Insurance:** Crop insurance is a federally subsidized insurance policy that protects farmers in the instance of crop loss due to many different modes of crop loss. Examples include hail, wind, fire, pests, etc.
8. **Crop Insurance Initial Planting Dates:** Each year, crop insurance providers set initial planting dates which change by geography. Any crop planted prior to this date will not be covered for replanting payments if adverse weather impacts the initial stand.
9. **Crop Varieties:** A crop such as corn has many different brands and products. Just as smartphones encompass various brands like Apple iPhone, Google Pixel, and Samsung Galaxy, each brand has multiple models (e.g., iPhone 15 Pro Max, Pro, iPhone 15). Similarly, corn has many different brands (Ex. Pioneer or DeKalb) and varieties (P13050V or DKC62-08). Each variety possesses unique characteristics, making it suitable for different growing conditions. A map of the many different seed brands and parent companies can be found in the following [Ag Web Article](#). (Some changes have happened since it was published)
10. **Drip Tape:** Drip tape is an efficient form of irrigation where underground or surface tubing is used to send minimal amounts of water to plants in a field. This form of irrigation is more common in vegetable, fruit, and/or orchard production systems but improvements in technology have allowed it to be used in row crops.



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11. **Farm Gate:** A general term used to describe all activities that happen on a farm prior to a crop leaving said farm.
12. **Fertility:** Nutritional management of various fertilizers and soil amendments to grow productive crops and maintain soil balance.
13. **Foliar Fertilizer:** Fertilizers applied to the leaf surface using a large sprayer or airplane. The fertilizer rate is generally in much smaller quantities compared to soil-applied nutrients.
14. **Side Dress Fertilizer:** A method of driving through the field and applying fertilizer (typically nitrogen) to the growing crop 4 - 8 weeks after emergence. The fertilizer can be spread out over the top (Broadcast) of the cash crop or placed in narrow bands (banded/streamed) between the rows of the actively growing crop.
15. **Furrow Irrigation:** This type of irrigation technique uses a series of strategically placed polyethylene pipes across the surface of the land to send water by gravity in furrows/channels throughout a field to water crops.
16. **Grain Marketer:** A grain marketer is an advisor who specializes in monitoring crop markets and strategizing the optimal timing and methods for farmers to sell their grain. Grain marketers can operate as independent consultants, small firms, or as part of a larger organization. While not every farmer may work directly with an independent grain marketer, they will typically engage with one through their chosen sales channels to negotiate crop sales.
17. **Industry Rep:** Industry rep is a shorthand term for a person who represents a specific product, product line, or class of inputs. For example, a pesticide advisor is often referred to as a "Chem/Chemical" "Rep/Guy/dealer/supplier."
18. **Irrigation:** Irrigation is the process of watering crops using ground or surface water through methods such as center pivots, furrow irrigation, drip tape, and other techniques.
19. **Precision Dealer:** An advisor who sells and services precision equipment.
20. **Precision Equipment:** Equipment, attachments, hardware, and software which use guidance/navigational systems to map fields, track/control application rates, drive equipment, and improve efficiency.
21. **Post-emergent Herbicides:** Herbicides applied after the crop has been planted and has emerged. Generally, these applications occur 2 - 6 weeks after planting and are done with a sprayer.
22. **Pre-emergent Herbicides:** Herbicides applied prior to cash crop emerging from the soil to keep weeds in check and allow for a clean field (similar to a perfectly manicured lawn) while planting and during early seedling development.
23. **Primary Tillage:** This type of tillage is the deepest and causes the most soil disturbance, typically occurring in the fall to aerate the soil and break up residue. It often involves 1–2 passes across a field and is most commonly used in conventional tillage programs, though it may not be included in reduced tillage practices.
24. **Production Cycle:** The period of time post-harvest of the previous crop to harvest of the current crop commonly coined as harvest to harvest.



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25. **Secondary Tillage:** This type of tillage is used in combination with primary tillage. A primary tillage implement/device leaves the soil surface rough and bumpy. A secondary tillage tool will smooth the surface, chop residue, and leave the field fit for planting.
26. **Spring Cash Crops:** Cash crops planted in the spring from March - May. These include corn (87 - 95 million acres), soybeans (82 - 87 million acres), cotton (8 - 12 million acres), rice (2 - 3 million acres), peanuts (1 - 2 million acres), etc.
27. **Summer Cash Crops:** Crops planted in the summer during the months of June and July. Examples include sorghum/milo (6 - 10 million acres), buckwheat, summer cover crops, and more. These are a much smaller market share compared to others.
28. **Tillage:** The process of mechanically inverting, conditioning, and/or disturbing soil in order to prepare it for crop production. Tillage is commonly used for smoothing soil, breaking up compaction or tight soil layers, incorporating fertilizer/manure, managing crop residue, influencing soil temperature, and more.
29. **Winter Cash Crops:** Crops planted in the early fall that stay dormant over the winter and are harvested the following spring/early summer. Examples include winter wheat (30 - 40 million acres), winter barley, cereal rye, triticale, and more.