

GROWING SEASON

This lasts 16 weeks from May to October

- Average temperatures range from 52.5 to 74.8 degrees Fahrenheit.
- Average rainfall over the six month time period is 25.41 inches.
- Due to slightly unpredictable seasons in the Midwest, lower temperatures in May may result in delayed planting, while early frost may result in an early harvest, leading to a shorter maturity level of the corn plants.
- Fall frost dates fall between October 11 and November 4.

RECENT HISTORY

The Midwest has encountered several regional agricultural challenges in recent years.

- In 2012, the Midwest saw the most severe and extensive drought in 25 years – this drought impacted crop and livestock sectors, as well as food prices.
- In 2013 and 2014, Palmer amaranth, a southern weed that can grow up to seven feet tall and produce 100,000 seeds on one plant, invaded Midwestern fields.
- In 2014, severe flooding and tornadoes in the Midwest hit during late summer, slightly impacting the corn harvest.
- In 2013, an April flash flood hit multiple areas of the Midwest, resulting in millions of dollars of damage to farms and the agricultural industry.
- The Midwest routinely sees the western corn rootworm and ear-feeding caterpillars in corn crops.

CLIMATE CHANGES

Due to climate change, average temperatures have increased over the last several decades – heat waves are more frequent and cold periods are even more rare. Snow and ice are arriving later in the fall and starting to melt earlier in the spring. Heavy downpours now occur twice as frequently as they did a century ago. Some challenges that farmers may face due to climate change include: wetter conditions in the spring that may make it difficult for farmers to plant their crops; more frequent heat waves, floods and droughts will place additional stress on agriculture; and higher temperatures will stress livestock animals.

ECONOMICS

Commodity prices are extremely important and most farmers choose to purchase insurance that covers up to 75 percent of their crops.

In 2013-2014, farmers received on average \$4.46 USD per bushel of corn.



SCENARIO INFORMATION

Midwestern U.S.
FARMER

You are a Midwestern U.S. farmer managing 350 acres of corn fields, but you are challenged to predict the unpredictable when it comes to severe weather swings that are changing the nature of the growing season.

REGION



Midwestern U.S.

ACREAGE



350 Acres

TARGET
AVERAGE YIELD



159 Bushels/Acre

BUDGET



\$248,500

TECHNOLOGY MARKETPLACE

	OPTIONS	TECHNOLOGY AVAILABLE
PLANTING	SEED CHOICES* (One seed option required)	Hybrid
		GMO/Traited
	TREATMENTS	Seed Applied Products
	PRECISION AGRICULTURE	Precision Agriculture Software for GMO Seeds
		Precision Climate & Weather Mobile App
	NEW PLANTING EQUIPMENT	Planting Equipment - Planter & Tractor
Precision Planting Retrofit		
CROP MANAGEMENT	COVER CROPS	Cover Crops
	IRRIGATION SOLUTION	Center Pivot Irrigation System
	SOIL MANAGEMENT	Microbials
		Synthetic Fertilizer - 50% Formula
		Synthetic Fertilizer - 100% Formula
	CROP PROTECTION	Insecticide (Option to purchase multiple applications)
Herbicide (Option to purchase multiple applications)		
HARVEST	NEW PLANTING EQUIPMENT	Combine/ Harvesting Equipment
		Storage Fee (Required purchase)

	COSTS	EFFECT ON YIELD %	
This hybrid variety can help preserve yield potential in limited water conditions.	12%		
This GMO/traited seed includes the Bt trait, which protects against damage from corn rootworm (prevalent in the U.S. and Brazil). It also provides U.S. farmers with the broadest spectrum of above - and below-ground insects, as well as herbicide tolerance.	17%		
Seed applied products, like fungicides and insecticides, are a technique in which crop protection elements are applied to the outside of the seed. Using a treated seed can help lower the number of pesticide sprays needed, as well as help boost overall yield.	5%	5%	yield increase if purchased
This technology is only available for GMO/traited seeds. Precision Agriculture Software provides valuable information using seed science, agronomy and data analysis, which enables you to plant at the right density and choose the correct seed. It can help boost overall yield.	5%	10%	yield increase if purchased
These mobile apps provide weather, soil and crop data on a field level basis that can improve planting decisions. Field and weather information is updated in real time enabling you to make farming choices as soon as possible.	5%	10%	yield increase if purchased
A planter is necessary to start off the growing season. Purchasing a new planter guarantees working machinery for this growing season. A tractor is required to pull the planter.	30%		
This is an addition for your planter that enables you to plant twice as fast, which will help you beat any weather delays resulting in a late planting. It may also include electronic components, such as a GPS and iPad.	16%	5%	yield increase if purchased
Cover crops are plants seeded into agricultural fields, within or outside of the regular growing season, with the primary purpose of improving or maintaining ecosystem quality. These crops can include grasses like wheat, or legumes like alfalfa, and can help prevent fertilizer runoff, soil erosion and soil denitrification from heavy rains. Use of cover crops can often reduce the cost of fertilizer.	5%		
Irrigation is a means of bringing in more water to your crops in the event of drought. The cost listed includes buying the irrigation system.	20%		
Microbials are applied to seeds before planting, in-furrow or sprayed on crops. They can help protect crops from pests and diseases and enhance plant productivity and fertility.	5%	5%	yield increase if purchased
Synthetic fertilizers are applied to soils or to plant tissues (usually leaves) and supply one or more plant nutrients essential to their growth. Most fertilizers increase nitrogen and can help boost your overall yield.	10%	10%	yield increase if purchased
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Insecticide can help prevent insect infestation, as well as manage current infestations. One application can help manage one infestation. U.S. farmers typically spray two times.	5%		
Herbicides can help prevent weed infestation, as well as manage current infestations. Weeds can compete with your crops for nutrients, resulting in a lower yield. One application can help manage one infestation. U.S. farmers typically spray two times.	5%		
A combine is necessary to finish the growing season and harvest your crops. By purchasing a new one, it guarantees you working machinery for this harvest.	12%		
Once you harvest your crops, you need to store and protect them from insects. This is a required purchase for U.S. farmers.	2%		