ACRES OF GOLD

THE CORN YIELD OPTIMIZATION GUIDE

PRESEASON PLANNING & PREPARATION

ENVIRONMENT

OPTIMIZING CORN YIELD POTENTIAL

Optimizing corn yield potential requires a balanced management approach that strives to maximize corn yield in favorable conditions while managing weather-associated risks. *Table 1* shows the hierarchy of "corn yield wonders" as established by the research of Dr. Fred Below with the University of Illinois. In his research "weather" accounts for 27% of total yield potential.

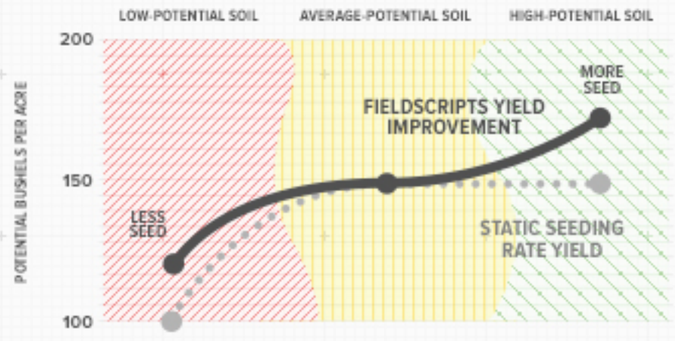
7 WONDERS OF CORN YIELD
Weather
Nitrogen
Hybrid
Previous Crop
Plant Population
Tillage
Growth Regulators

Figure 1

EQUIPMENT

VARIABLE RATE PLANTING

Plant density and uniform spacing between plants are essential to obtain optimal corn yield potential. Variable rate planters provide an opportunity to match optimum seeding rates to the productivity of each segment of a field.

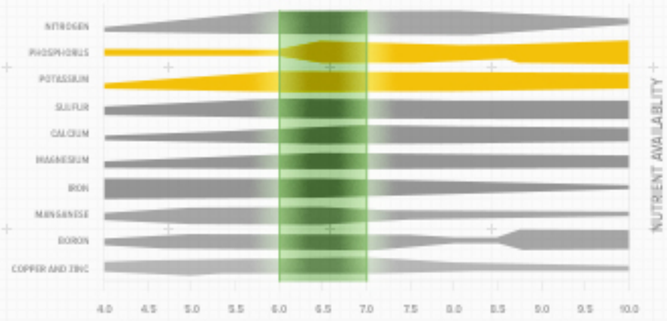


FieldScripts.

FERTILITY

THE IMPORTANCE OF SOIL pH

Using current soil test values and determining crop removal rates of nutrients like Phosphorus (P) and Potassium (K) can help guide fertility management decisions.



INSECT MANAGEMENT

INTEGRATED PEST MANAGEMENT

DEFINING INTEGRATED PEST MANAGEMENT

- Integrated pest management is a holistic approach to combating yield-robbing pests that focuses on monitoring the life cycles and prevalence of pests in a farmer's fields to determine the best pest control methods for the current and following growing season.

WHY INTEGRATED PEST MANAGEMENT IS ESSENTIAL TO PROTECT CORN YIELDS

- As farmers across the Corn Belt continue to battle above- and below-ground insect pests year after year, a comprehensive integrated pest management approach is key to maximizing yield, especially in corn-on-corn environments.
- Measuring insect pressure helps growers think forward, making more informed pest management decisions for the following year about their seed choice and agronomic practices.

HOW TO IMPLEMENT INTEGRATED PEST MANAGEMENT ON YOUR FARM

- Each field experiences different insect pressure. Prior agronomic practices, like corn-on-corn, can create significantly higher pest pressure than in fields previously rotated with other crops.
- To get more corn per acre, farmers need to have a solid understanding of the level of pressure and type of pests they are dealing with in order to choose the best corn traits and agronomic practices to address those challenges.
    - Scouting to identify current pest pressure in your fields. Tools like insectforecast.com can help you better choose the best time to scout.
    - If pests are found during scouting, integrating best management practices to better control insect pests for the current growing season and beyond.

PRESEASON PLANNING & PREPARATION

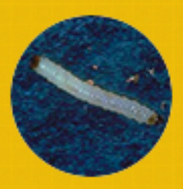
INSECT MANAGEMENT

OVERWINTERING VS. MIGRATING

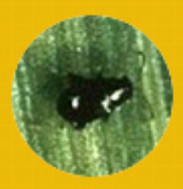
Understanding the presence and potential impact of insect pests is critical to planning for and implementing successful insect management practices in corn-on-corn systems.

OVERWINTERING

Many insect pests of corn have the potential to survive thru the winter in major corn growing geographies. Depending on species, insects may overwinter as eggs, pupae, adults or various immature stages.


NORTHERN CORN ROOTWORM


WESTERN CORN ROOTWORM


CORN FLEA BEETLE


EUROPEAN CORN BORER


GRAPE COLASPIS


WHITE GRUB


WIREWORMS

MIGRATING

Other insect pests do not overwinter, but, instead, rely on spring weather patterns to assist with their migration from the south.


BLACK CUTWORM

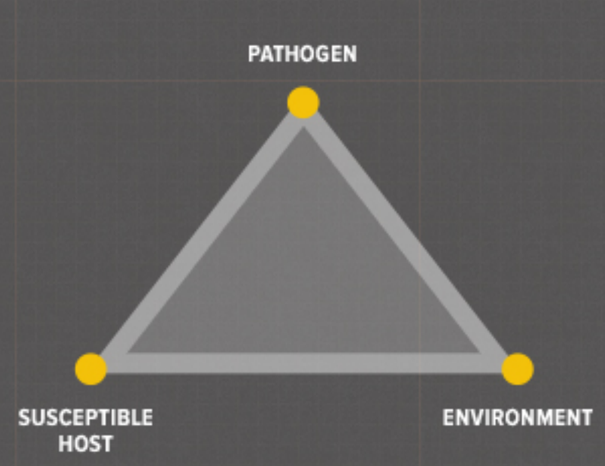

CORN EARWORM


ARMYWORM

DISEASE MANAGEMENT

THE DISEASE TRIANGLE

The disease triangle illustrates that the amount of disease that occurs in a particular field depends on the quantity of the pathogen present, the resistance or susceptibility of the host, and the extent to which the environment is favorable for that disease.



WEED MANAGEMENT

CONTROLLING WINTER ANNUALS

Successful weed management solutions require full-time attention, particularly outside of the growing season. Winter annual weeds can become a major problem when not controlled in the fall or early spring prior to planting.

PRESEASON PLANNING & PREPARATION

RESIDUE MANAGEMENT

TILLAGE OPTIONS AND ALTERNATIVES

Heavy residue is managed in corn on corn systems depends on soil conditions and available equipment.

TILLAGE OPTION	DESCRIPTION	PROS	CONS
Conventional	Traditional two-pass system for continuous corn production Fall — Deep chisel or ripper. Spring — Secondary pass with a field cultivator or soil finisher.	Burial of residue and warmer, drier soil environment.	Fuel and labor intensive; increased risk of soil erosion.
Spring One Pass	Generally done with a soil finisher; implement with a row of disk gangs followed by up to six rows of field cultivator shanks and a finishing attachment such as a harrow or rolling basket.	Less fuel and labor intensive, generally good seedbed preparation while leaving a lot of residue on soil surface for erosion control and moisture capture.	May not be aggressive enough for heavy residue environments; does not promote residue breakdown over winter months; can lead to yield robbing soil compaction problems in some soils, especially when wet.
Vertical	Vertical tillage implements commonly have a set of straight blades, aligned vertically that are designed to size residue and break up the soil surface to allow for drying and warming of the seedbed. Fields with compaction problems and hard, clay soils can benefit from this type of tillage.	Residue is left on the surface to aid in erosion control while also mixed in the top few inches of soil to aid in residue decomposition.	Vertical tillage implements are heavy and require significant horsepower to pull them at intended speeds. This can actually result in compaction problems if soils are too wet at the time of operation.
Strip-Till	Combines the best aspects of vertical tillage and no-till. Typically, 4- to 5-inch-wide strips are cleared and approximately 4-inch-tall berms are built in the fall while fertilizer is applied below the surface. Strip-till operations can also be conducted in the spring, however, a rolling basket is likely needed to crumble clods and firm the seedbed behind the unit prior to planting. Applying fertilizer in close proximity to the seed can also be risky due to increased chances for seedling injury or death.	Combines the benefits of no-till with vertically-tilled strips that reduce residue interference with planting operations and allow soils to warm and dry faster for earlier planting.	Requires specialized equipment and precise planting to ensure planted rows fall within the prepared strips. Minimal residue sizing and incorporation results in slower decomposition.
No-Till	By definition, tillage is not conducted with the exception of knives or shanks to apply fertilizer. Row cleaners are often used ahead of coulters and disk openers to help clear residue from the furrow and warm soils. Not unlike planting into a tilled seedbed, successful no-till planting involves waiting for proper soil conditions such as temperature and moisture levels. Often, if a field is dry enough for tillage it is dry enough to plant.	Crop residue reduces soil erosion and fertilizer losses while often improving soil structure and microbe populations over time. Crop residue can also help conserve soil moisture and keep soil temperatures cooler for improved crop growth in dry spring and summer conditions.	No-till soils are slower to warm and dry in the spring which can delay planting and emergence. Residue may also affect planter performance and seed placement. No-till comes with a learning curve of what practices work best and a transition period for yields to reach optimum levels.
Crop Rotation	Crop rotation to low residue alternative crops such as soybeans, sunflowers, safflowers, peas, lentils or flax can help manage the amount of crop residue present for future crops. Crop rotation can also help increase the diversity of soil macroorganisms and microorganisms and decrease the impact of disease and insect pests.		
Cover Crops	Cover crops can be grown for seasonal cover and conservation purposes to increase soil and water retention, organic matter levels and soil productivity. Farmers adopt cover crops because their use is linked to soil and water conservation, soil health, crop yield sustainability, enhanced crop performance, and livestock production. Environmental benefits of cover crops include reduced erosion and protection of water quality. Cover crops can also increase long-term profitability and the ability of a cropping system to rebound from intensive farming programs.		