

. . . For Higher Yields



PLANTING PRODUCTIVITY —

INDEX

Planting Productivity

A Timing and Agronomic MatterPage 3

Time — The Key Operational Driver

Timeliness – Yield Potential and Equipment CostsPages 4 and 5

Seed Bed Conditions

Soil Temperature and MoisturePage 6

Seed-to-Soil ContactPage 7

Seed Placement Accuracy

In-Row SpacingPage 8

Seed Size PlantabilityPage 9

How do you implement the Planting Productivity Objectives?

The Planting Productivity ObjectivesPage 10

Answer: The Case IH Planting Productivity System

The Planting Productivity ProcessPage 11

Planter Productivity at its Best – Case IH Planter Productivity Systems

Trailing Toolbar Configurations:

The Most Productive Corn Planter SystemsPage 12

Three Point Mounted Toolbar Configurations:

The Most Productive Cotton Planter SystemsPage 13

The **Case IH planting productivity system** is a system based on understanding the needs of the plant growth cycle, with a special **focus on optimizing seed bed conditions and seed placement**. The more we learn about the controllable factors that can drag down our yield potential, the more we are led toward a greater understanding of how we can reach more of that yield potential. At the same time we realize these agronomic objectives need to be met while optimizing equipment productivity. That is the ultimate recipe for success. **This booklet is intended to enhance that process.**

- **The planter is the most important piece of equipment on your farm.** It has the most potential to set the course of your whole season.
- Agriculture has become a business based on margin and volume, so there is a **need to maximize acres per day of production without compromising yield potential.** Your profitability depends on it.

A TIMING AND AGRONOMIC MATTER

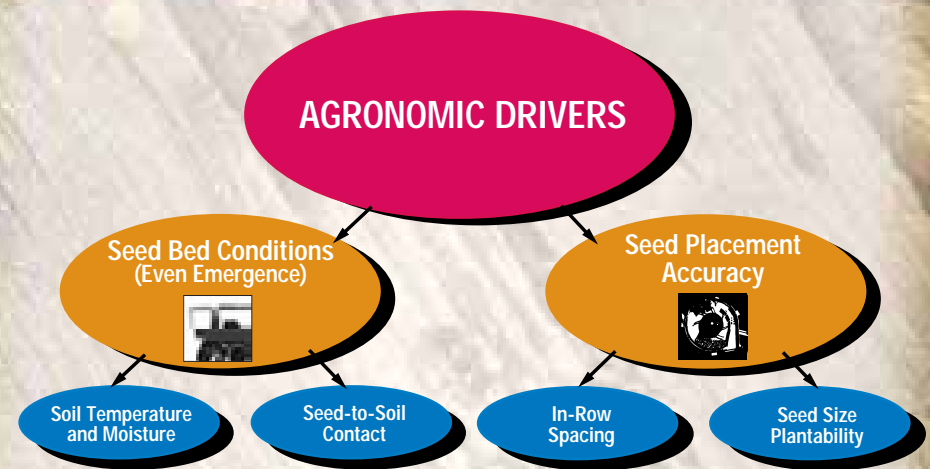
HOW MUCH TIME DO I HAVE TO PLANT?

- The planting season is typically very short to achieve optimal yields.
- **There are yield penalties for delayed planting.** Here are some examples.

Location	Optimum Date for Corn Planting	Yield Loss by Planting 10 Days After Optimum Date
Southern Minnesota	May 8	17%
Southern Wisconsin	May 4	7%
Central Illinois	April 27	3.5%

SOURCES: University of Illinois, University of Wisconsin, Pioneer Hi-Bred Int'l.

WHAT AGRONOMIC DRIVERS DO I NEED TO PAY ATTENTION TO?



Planting Agronomic Drivers center on seed bed conditions and seed placement accuracy

- The **#1 agronomic driver** is early, even emergence
 - **Uneven emergence can reduce corn grain yields by 10 to 20%.** (Purdue University)
 - Uneven emergence is the **same as planting the crop after the optimum date.**
- The **#2 agronomic driver** is seed placement accuracy.
 - **Plant spacing variability can reduce corn grain yields by 2 to 8%.** (Purdue University)



PLANTING PRODUCTIVITY – A TIMING AND AGRONOMIC MATTER

HOW MUCH TIME DO I HAVE TO PLANT?

- **Not being timely during planting can result in lost yield potential** if you are found in the field past the optimum date (see yellow line in Figure 1).
- As farm size increases, **timely planting can be achieved by dedicating more equipment and labor** to the planting process.
- The amount of time that is available to plant **depends on two factors:**
 1. the **number of days** suitable for fieldwork and
 2. the **size of the farming operation** (see Figure 2).
- **Acres per day** required for timely planting **drives productivity.**

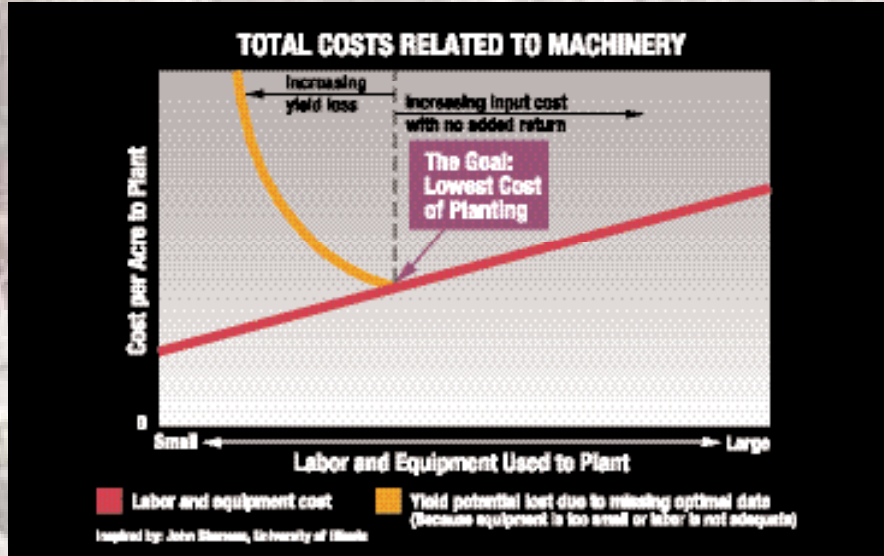


FIGURE 1. Optimal equipment sizing minimizes yield potential lost through untimely planting while not overinvesting in equipment to get the job done. (Graph example is for fixed number of acres.)

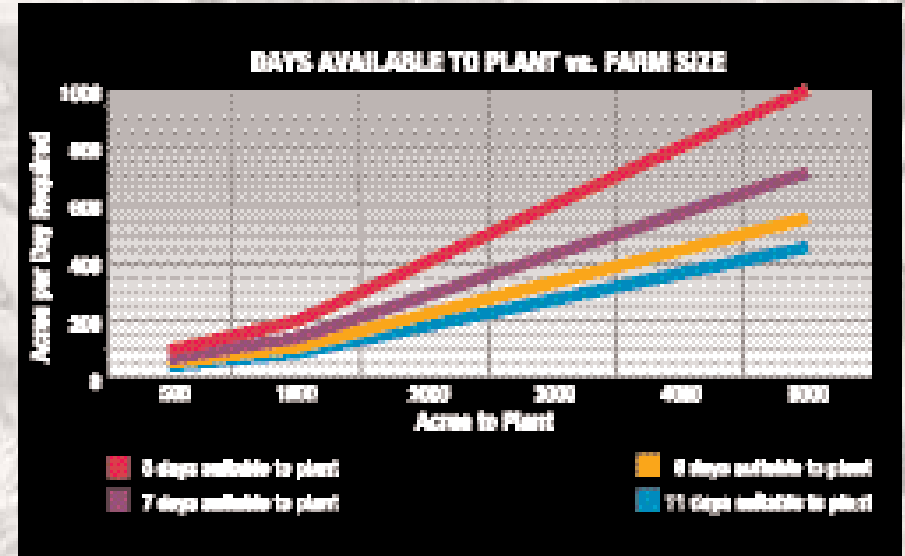


FIGURE 2. The number of acres per day required to assure timely planting depends on the size of your farm and the number of days that are fit to plant.

HOW CAN I INCREASE THE PRODUCTIVITY OF THE PLANTING PROCESS?

• There are two different ways to increase operational productivity of an untimely operation:

1. operate **larger equipment** Ⓚ
2. operate at **higher ground speeds** (see Figure 3)

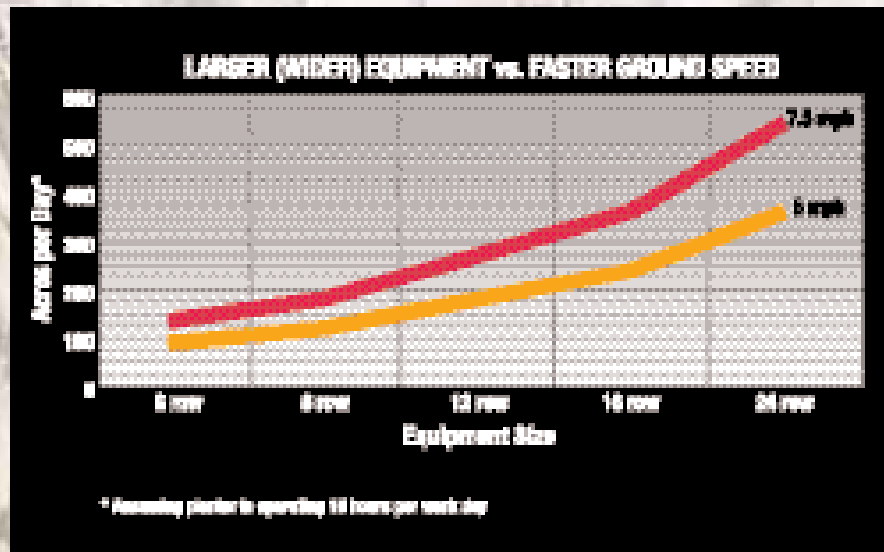


FIGURE 3. You can achieve the acres per day required for timely planting two different ways:

1. larger equipment operating at 5 mph OR
2. relatively smaller equipment operating at 7.5 mph

• Operating **traditional planter designs at higher ground speeds has compromised agronomic performance in the past**

(especially with older, poorly maintained, or misadjusted *traditional* planters) *due to diversity*)

• Poor performance has been the result of

1. planter **row unit bounce**
2. **meter inaccuracies** (excessive rpm)

• What happens when planting is delayed, or rain is on the horizon ?

Will you run your planter at higher ground speeds?

Wouldn't it be nice to do it without sacrificing agronomic performance?

THE PLANTER NEEDS TO:

Provide the acres per day to ensure crops are planted by the optimum date **without compromising agronomic performance:**

- Seed Bed Conditions
- Seed Placement Accuracy



SOIL TEMPERATURE AND MOISTURE

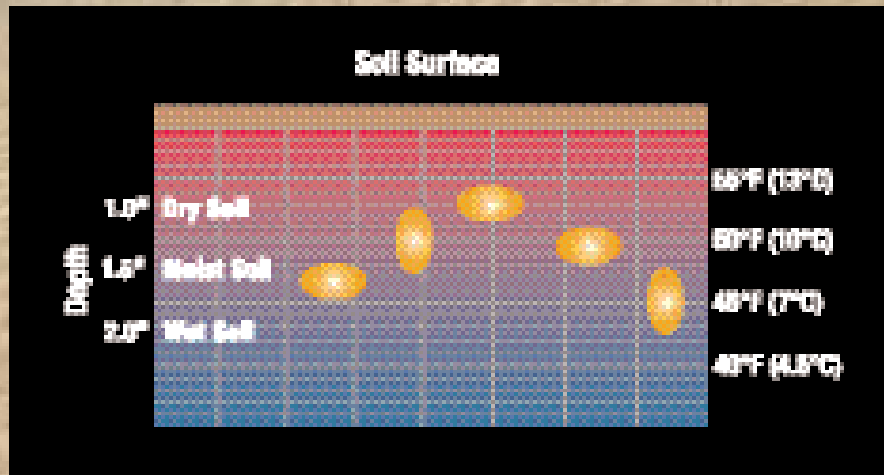


FIGURE 1. Seeds planted at different depths are exposed to different soil temperatures and moisture contents.

WHAT ARE THE PRIMARY CAUSES OF UNEVEN EMERGENCE?

- A study by the University of Minnesota found three major factors:
 - **Soil temperature** variability (e.g., uneven residue distribution)
 - **Soil moisture** variability within the seed zone
 - Poor **seed-to-soil contact** (e.g., cloddy soils)
- **Planting depth has an important impact** on the successful germination and even emergence of your crop because of interactions with soil temperature and moisture. (see Figures 1 and 2)

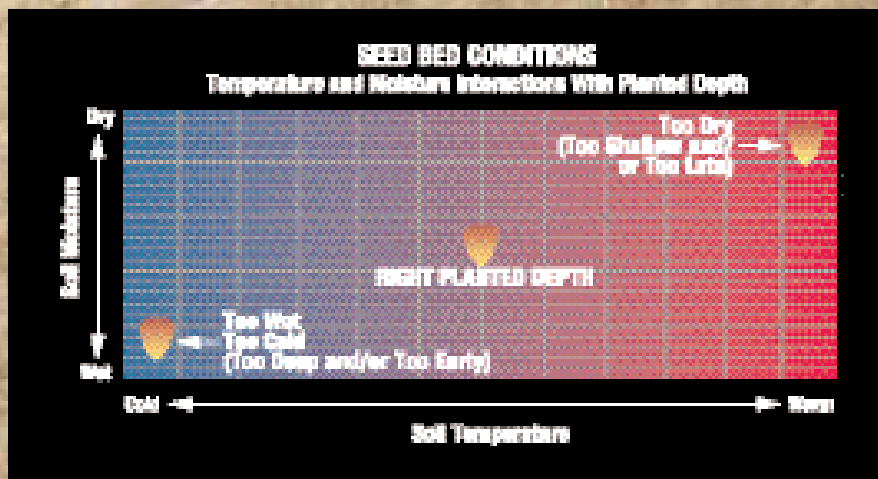


FIGURE 2. Soil temperature and moisture dynamics with planted depth and planted date.

HOW DO I DETERMINE THE PROPER PLANTING DEPTH?

- **Planting depth should be determined in the field** without exceeding the ability of the selected crop/variety (e.g., can't plant soybeans/cotton too deep and still achieve consistent emergence).
- The correct seeding depth should be **based on current field soil moisture conditions** and the 5 to 10-day weather forecast. (Purdue University)

THE PLANTER NEEDS TO:
Maintain a consistent planted depth into moist, warm soil.

SEED-TO-SOIL CONTACT

WHY IS SEED-TO-SOIL CONTACT SO IMPORTANT?

- **Uneven germination and emergence** can result from poor seed-to-soil contact (e.g., cloddy seed beds).
- A **cloddy seed bed** (i.e., large soil aggregates) is typically a low density/loose seed bed with lots of air pockets that **dries out** (see Figures 3a and 3b).
- Good seed-to-soil contact **provides the seed access to available water** allowing it to **germinate faster** (University of Minnesota).

- **Increase soil density to produce better seed-to-soil contact**, but be careful not to go too far and pack the soil (see Figure 4).

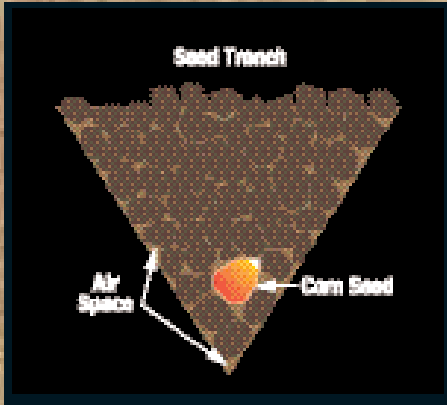


FIGURE 3a. Cloddy seed beds provide poor seed-to-soil contact which keeps the seed from germinating.

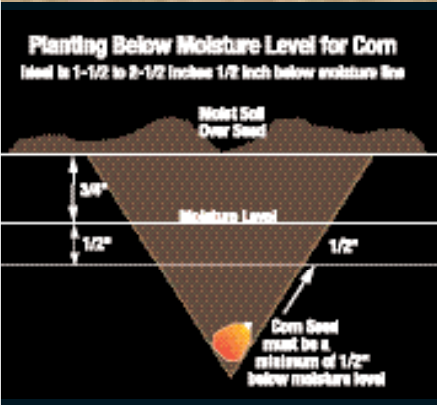


FIGURE 3b. Break down the clods to provide better seed-to-soil contact, faster water absorption and early, even emergence.

THE PLANTER NEEDS TO:
Produce optimum seed-to-soil contact in soil conditions ranging from loose/dry to hard/wet.

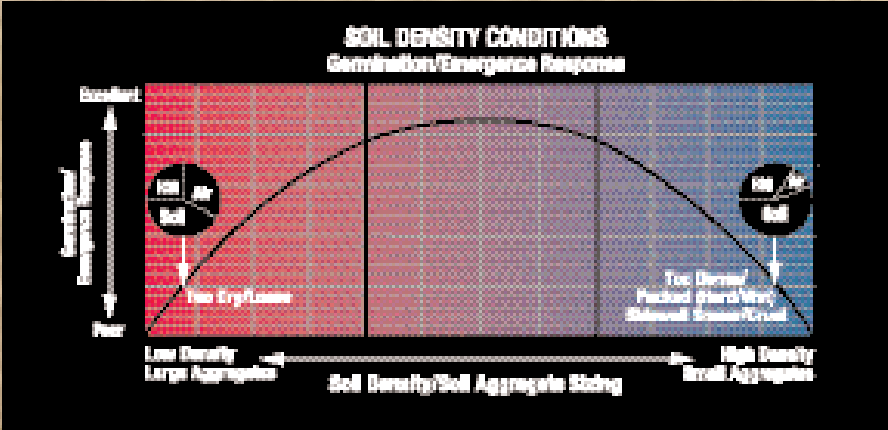


FIGURE 4. The optimal germination/emergence response is achieved with a soil that doesn't have a lot of clods, but isn't packed too much either.

- The optimal aggregate size may be **dependent on the crop** (see Figure 5).

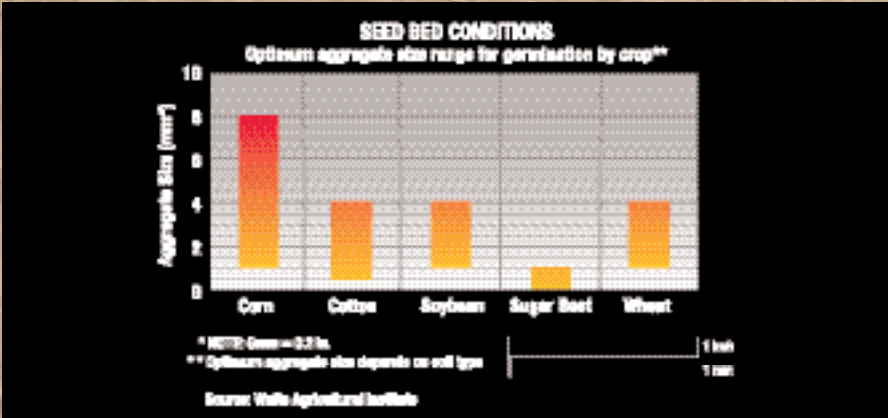
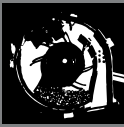


FIGURE 5. Optional soil aggregate conditions for germination depends on the crop.



IN-ROW SPACING

HOW DOES IN-ROW SPACING AFFECT MY YIELDS?

- Consistent in-row plant spacing is important to **reduce plant-to-plant competition**, especially for corn.
- Typically **seed-to-seed spacing that is off target three inches or more surpasses the agronomic threshold** of what corn plants seem to tolerate without yield loss (*Purdue University & Pioneer HiBred Int'l*). (see **Figure 1**)
- **Any** properly adjusted commercially available **planter should provide agronomically acceptable in-row corn plant spacing** within its suggested range of operation (*University of Guelph*).

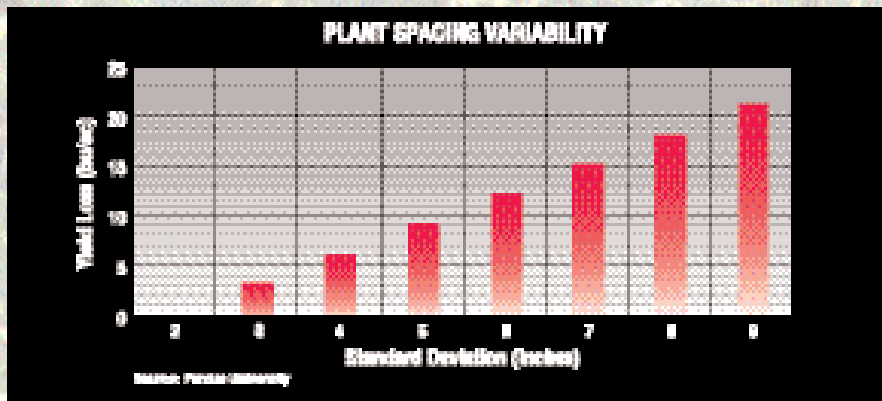


FIGURE 1. As the variability in plant-to-plant spacing increases, yield loss is observed for corn.

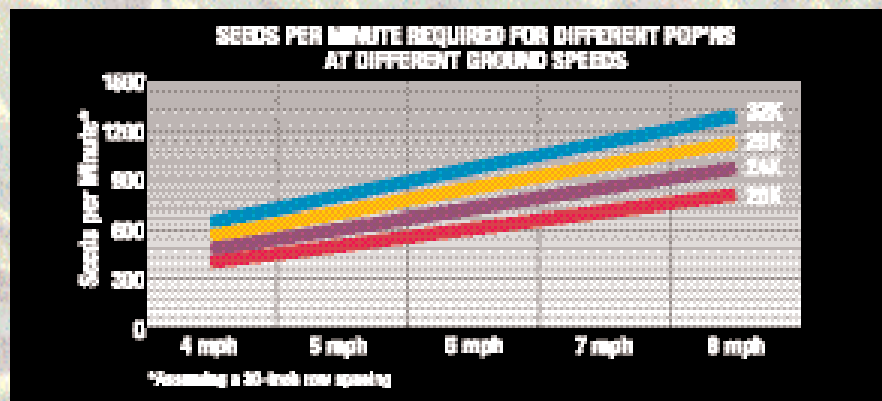


FIGURE 2. The seeds per minute required to be delivered by the meter depends on the ground speed of operation and the targeted planted population.

SO WHY DO I NEED TO BE CONCERNED ABOUT IN-ROW SPACING?

- In-row spacing **performance may degrade at low and/or high ground speeds** depending on meter design. Determine the number of seeds per minute that need to be planted at your farm using Figure 2.
- As planted populations increase, **certain meter designs may encounter ground speed limitations** to keep from exceeding rpm performance limits. Use Figure 3 to determine the meter rpm's required to plant the seeds per minute determined using Figure 2. Check your operator's manual for rpm limitations.
- There is also an **interaction between seed size plantability and ground speed** which can affect in-row spacing.

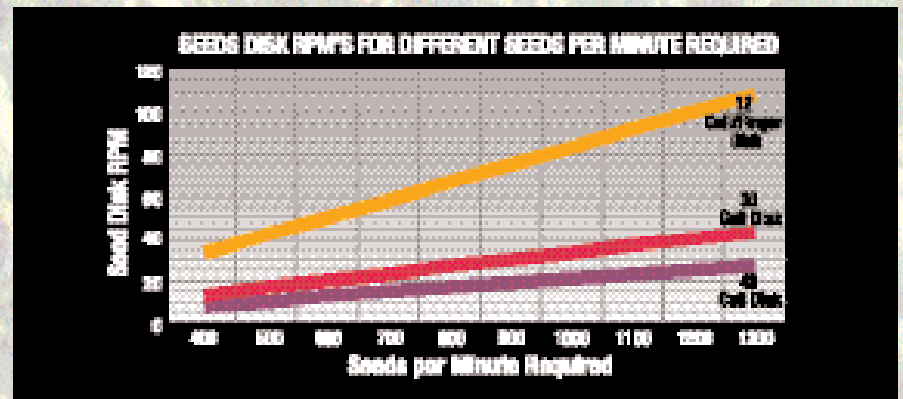


FIGURE 3. The rpm required by the seed meter to deliver the target population at the ground speed of operation depends on the number of cells/fingers in the system selected.

THE PLANTER NEEDS TO:

Hold desired **population and in-row spacing** within acceptable **agronomic limits** at all desired or actual planting speeds.

SEED SIZE PLANTABILITY

WHAT FACTORS SHOULD BE MY PRIMARY CONCERN WHEN SELECTING SEED?

- Ideally, when selecting a corn hybrid, a grower should be **concerned only with genetic potential, seed quality, and seed price** (*University of Wisconsin*).
- A harvested ear of seed corn produces **variable seed sizes** (see **Figures 4a and 4b**).
- New limited availability genetics or any genetics in poor seed production years may lead to **seed size availability limitations**.
- This range in seed sizes can create **plantability problems** for growers using *traditional* planters.



FIGURES 4a and 4b. Large-round classes usually come from the base of the ear, flats from the center, and small-round seed from the tip (*University of Wisconsin*). PHOTOS: Burrus Hybrids

HOW CAN A PLANTER AFFECT SEED PLACEMENT IN THE FURROW?

- Available **seed meter systems** can perform well over **different ranges of seed sizes depending on design** (see **Figure 5**).
- The **differences in meter performance** are a direct result of **design differences** between the systems.

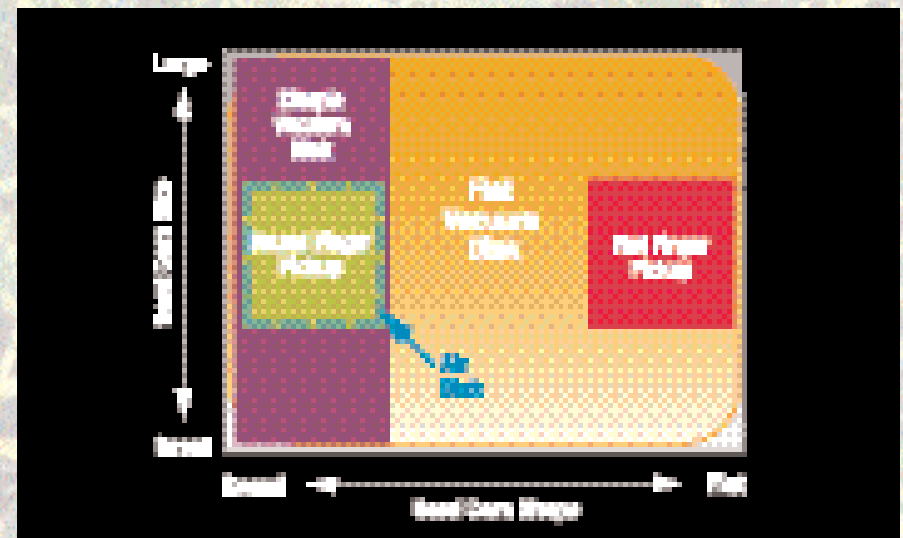


FIGURE 5. Each seed meter system has an optimal plantability seed shape and size range which is directly related to the particular design.

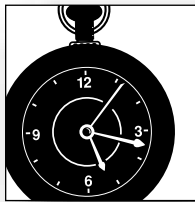
THE PLANTER NEEDS TO:

Plant accurately any seed size necessary to let you use the hybrid or variety you choose for genetic potential.

HOW DO YOU IMPLEMENT THE PLANTING PRODUCTIVITY OBJECTIVES?

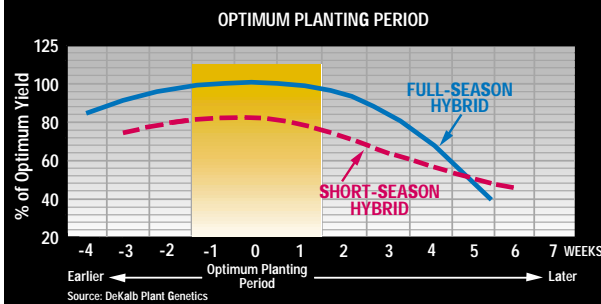
THE PLANTING PRODUCTIVITY OBJECTIVES

Optimizing the three objectives of operational timeliness, seed bed conditions, and seed placement is critical for maximizing operational and agronomic productivity.

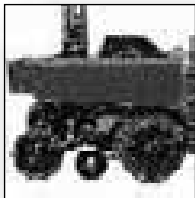


Operational Timeliness

Given the yield penalties for delayed planting, how do you manage to get the acres per day planted to achieve the goal of timely planting?



Using larger equipment or running at higher ground speeds can increase planting productivity as long as agronomic performance is not compromised.

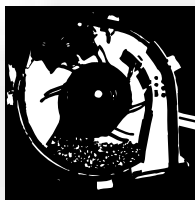


Seed Bed Conditions

Good seed-to-soil contact is necessary to insure the seed is able to absorb enough water to germinate and have a chance to deliver its full yield potential.



A narrower contact angle of the disc opening system will reduce the chance of smearing the seed furrow sidewall. A leading edge disc helps to cut residue cleanly.



Seed Placement Accuracy

Ideally, a grower should use a planting system that allows them to focus on selecting a seed for its genetic potential, and not on potential difficulties that might occur when planting a particular seed size.



In-row plant spacing is important for corn, but all modern commercially available planters should deliver agronomically satisfactory results when operating the planter within the manufacturers suggested range of operation.





THE CASE IH PLANTER PRODUCTIVITY SYSTEM
provides all of the objectives without compromise.

TRAILING TOOLBAR CONFIGURATIONS: THE MOST PRODUCTIVE CORN PLANTER SYSTEMS



Pivot Transport Toolbar

- Easy conversion between field and transport positions – do not need to leave the tractor cab!
- One meter for all crops
- Hydraulic drive seed metering for superior spacing accuracy
- Choice of central fill or on row hoppers
- Large flotation tires follow tractor's tracks
- Planter close coupled to tractor in field position for easy viewing
- AFS monitor allows you to monitor, map, and manage your planting season
- Full variable rate control of seed and liquid fertilizer

6- or 8- Row Narrow Trailing Toolbars

- Productivity of a larger planter, but with the maneuverability of a smaller machine
- Enjoy all-crop accuracy
- Superior spacing with all seed sizes
- Low maintenance planter system
- Empty hoppers and meters quickly with handy seed release door
- Optional endwise transport (8-row model only)



The Case IH planter productivity system provides the solution for managing all aspects of the seed's environment, for optimizing plant growth and maximizing yield potential.



**A system ba
agronomically
*Early Riser Row Unit &***

THREE POINT MOUNTED TOOLBAR CONFIGURATIONS: THE MOST PRODUCTIVE COTTON PLANTER SYSTEMS

The Case IH planter productivity system uses components that are uniquely designed to deliver an optimum soil environment for the early, even emergence of properly placed seeds.



Mounted on the
productive
Advanced Seed Meter.

Three Point Mounted Stackers

- Easy transport with stack-folding design
- Advanced Seed Meter plants more crops with fewer disc changes
- Slower seed disc rotation permits faster operating speeds
- Hoppers stay upright so you don't have to empty wing hoppers before moving
- Optional dual gauge wheels available for extra flotation in light soils and beds
- Optional lift assist wheels for additional stability and lift assist capacity



Three Point Mounted Rigid Toolbars

- Convenience, economy, and productivity in one planter system – an easy pick-up-and-go process
- Advanced Seed Meter transmission – 120 different population settings for complete control
- Early Riser Row Unit ensures early and even emergence
- Granular chemical and a myriad of tillage tools available as options
- Optional Early Riser II monitor offers mid-range monitoring capability





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CASE IH