



## Reference Guide

## Foreword

**A key factor** impacting yield potential of a corn crop is planting date. Plant too late, and the shortened growing season limits the crop's ability to produce to its fullest. Plant too early, and the seed is vulnerable to harsh early spring conditions that can cause uneven emergence and reduced stands.

Frequently, the challenge for corn growers is hitting the narrow window between planting too early and planting too late. For many farmers, it's extremely difficult to plant all their acres in such a short time. And some years, when the weather doesn't cooperate, they miss this ideal planting period completely.

Recognizing this difficulty, scientists at Landec Ag, Inc., spent the past several years devising a system that effectively widens the planting window for corn—a system that allows earlier-than-normal planting, but still provides for full and uniform stands.

Their expertise in seed coating technology led to the development of the Intellicoat® Early Plant™ seed corn coating—a functional polymer that controls germination in cool early spring soils to promote more timely, uniform emergence under optimum growing conditions, even in no-till.

With Intellicoat Early Plant, farmers can plant anywhere from a few days to as many as four weeks sooner than normal with minimal risk of stand loss. Being able to reliably expand the planting window like this means farmers can:

- Avoid late planting.
- Maximize yield potential.
- Spread workload.
- Finish corn planting early, and get a jump on soybeans.
- Reduce drying costs.

Now that Intellicoat technology is commercially available to you, Landec Ag offers this reference guide to further your understanding of the technology, to explain its place in early planting situations, and to offer recommendations for its use in your corn program so that you may optimize its potential.

# Reference Guide

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There are two keys to maximizing yield potential—timely planting and a uniform stand. The problem is, most years, farmers find they have to choose between one or the other. However, with new Intellicoat® Early Plant™ seed corn coatings, that is no longer the case.

## 1. Getting the Corn Planted On Time

To maximize yield, it is critical that your corn acres are planted before the end of the optimum planting period.

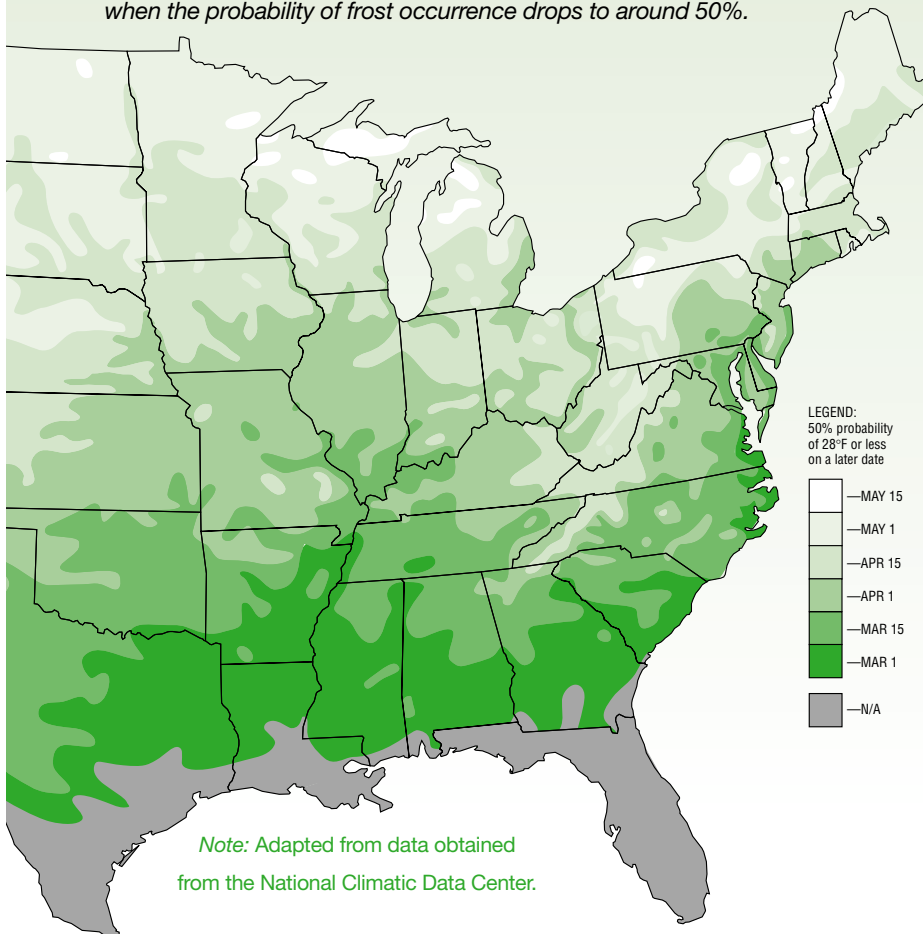
The optimum corn planting period for an area is the range of dates that provides the best combination of yield, moisture and quality. These dates are based on long-term average frost dates (Figure 1), frequency and timing of moisture and heat stress, pest avoidance, allocation of labor and marketing advantages.

Optimum planting dates generally provide a two- to three-week buffer between the date the crop reaches physiological maturity (maximum dry matter accumulation) and the average date of the first killing frost.

On average, the optimum corn planting period is two to three weeks long. Often, however, only a third to one half of those days are suitable for field work, making it very difficult to get all your acres planted in time. And therein lies the problem. Research shows that plantings completed after this optimum period will typically result in lower yields (Figure 2).

**Figure 1 Spring Freeze Occurrence**

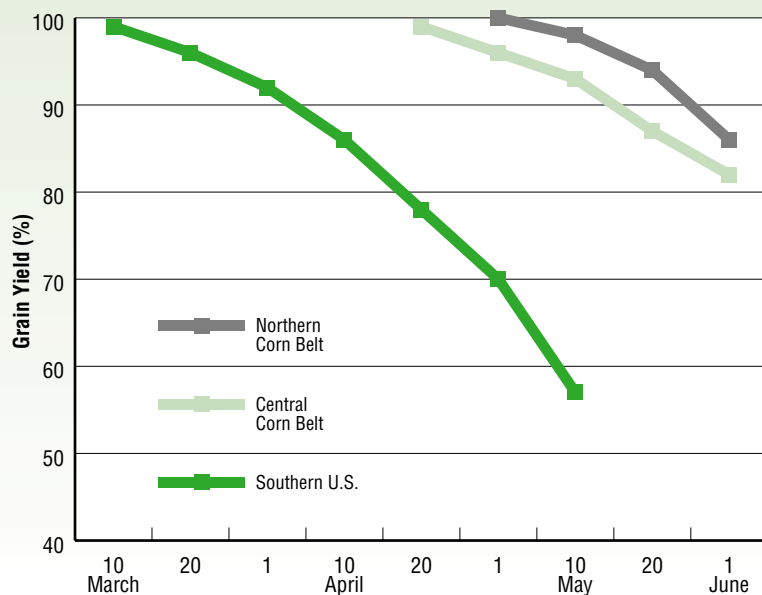
Traditionally, growers decide when to plant based on historical record of average frost-free dates. For many, the optimum planting period begins when the probability of frost occurrence drops to around 50%.



## Two Keys to Maximizing Yield

**Figure 2 Declining Yield Potential With Late Planting**

For farmers in the Corn Belt, a planting delay of four weeks can reduce yield by as much as 20%.



Source: Hicks and Wright 1986.

In the first few days of any given planting delay, yields decline at a slow rate, approximately 0.5 percent per day. But as planting is delayed further, yields decline at a much faster rate, approximately 2.5 percent per day (Hicks and Wright 1986). This decline occurs for a number of reasons, including a shorter growing season, insect and disease pressure and heat and/or moisture stress during pollination.

Apart from yield loss, planting after the optimum period can also result in other profit setbacks, such as higher drying costs at harvest because of limited field drying.

Given the risks associated with late planting, many growers have moved to early planting, well before the optimum planting period. But cold soils associated with early planting often mean sacrificing the second key to maximizing yield: greater, more uniform stands.

## 2. Achieving Uniform Stand Establishment

A healthy stand that maximizes yield depends on survival of the seed and uniformity of plant spacing and size. Both loss of stand and stunting of plants occur when seeds and seedlings suffer chilling injury under cold early spring conditions.

### Survival

As corn seeds struggle to germinate at temperatures below 50°F, they can be killed, either directly by the cold or by soil fungi, particularly because seed treatment fungicides often fail under extended cold, wet conditions.

Knowing how early planting often reduces stands well below the optimum for yield, many growers will sometimes try to compensate by increasing the planting rate. This

cannot be pushed too far, however, because seed survival is very unpredictable. Under warmer than expected conditions, stand can end up too high. Even if the optimum population is achieved on average, plant spacing will not be uniform.

### Plant Spacing

Corn plants next to a gap in the row may compensate to some extent for missing plants by producing larger or additional ears (if the hybrid has a prolific tendency), but rarely does this replace the lost production from missing plants.

In other cases, plants can end up spaced so closely together in the row that they compete excessively for sunlight, water and nutrients. These areas in the field are particularly troublesome under possible water stress, when crowding may result in barren plants or ears too small to be harvested. Lodging is often severe in these areas.

The fact is, even spacing notably improves corn yields. Recent studies suggest that many corn growers could increase grain yield by 4–12 bushels per acre if within-row spacing were more uniform (Nielson 1997).

**Plant Uniformity**

Not every seed in the bag is equal in vigor or in the ability to resist cold stress. When corn is planted very early, these differences are manifested by stunting of some seedlings and different growth rates among seedlings in general. To achieve high yields, corn must be grown at high populations. Under these conditions, each plant is on a knife-edge of competition. When

adjacent plants differ in initial size and growth rate, the smaller plant often contributes very little yield, and may become a functional weed.

Research at the University of Illinois and the University of Wisconsin has shown plants that are three weeks, growth behind their neighbors contribute nothing to yield, and might as well be absent (Carter, Nafziger and Hicks 1992). This is why it almost

never makes sense to fill in a poor stand by offset planting of additional seed into an existing stand. By the time you discover the problem and get around to planting, it is too late. The newly planted seeds can never compete with the seedlings that have survived from the earlier planting.

A field with poor stand from very early planting can often be torn up and replanted with little yield loss.

**The Bare Essentials for a Good Stand**

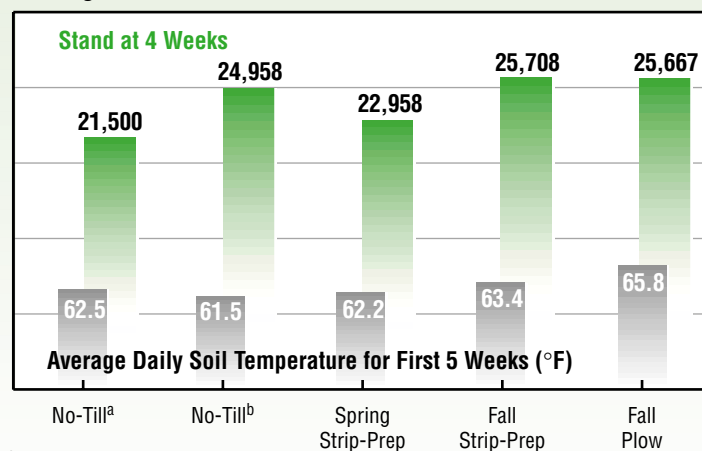
Adequate temperature and moisture and good seed-to-soil contact are essential for rapid and uniform corn stand establishment. If any one of the three is missing, germination and/or emergence will suffer.

1. Soil temperature must exceed 50°F (the threshold temperature) for uncoated corn seeds to germinate and emerge quickly and evenly from the soil. The temperature of the soil around the seed is influenced by soil color, residue level, moisture content and planting depth (*Figure 3*).

- Dark-colored soils will typically warm faster than light-colored soils.
- Bare soil typically warms faster than areas with residue cover.
- Dry soils typically warm faster than wet soils.
- Deeper-planted seeds are generally exposed to cooler soil temperatures than shallow-planted seeds.

**Figure 3 The Importance of Soil Temperature**

The effects of soil warming on stand establishment are best seen in comparison studies of no-till to conventional tillage systems. In these comparisons, no-till applications take longer to warm up because they have higher residue levels.



<sup>a</sup>Planted in last year's corn rows

<sup>b</sup>Planted between last year's corn rows

Study conducted in Lafayette, Indiana, 1994

Source: Griffith, West, Steinhardt, Hill and Parsons 1994.

2. Corn seeds must absorb (imbibe) approximately 30 percent of their weight in water to trigger germination. Uniform soil moisture around the seed is essential for uniform germination. Moisture differences caused by soil characteristics, tillage patterns or variable seeding depth can cause uneven germination and emergence.

3. Good seed-to-soil contact is necessary for the seed to absorb moisture quickly and evenly. Surface residue in no-till planting, cloddy soils created by working the soil when it's too wet, and planting into excessively wet soils can make it difficult to achieve good seed-to-soil contact. Seed-to-trash, seed-to-clod or seed-to-air contacts are not good environments for seed germination.

## The Impulse to Plant Early

### The Benefits of Planting Early

Research clearly backs the decision to plant early. Studies consistently show the yield reduction from planting too early will be significantly less than that experienced from planting too late by an equal number of days (*Figure 4*).

Beyond that fact, there are many other benefits related to early planting, such as:

- **A longer growing season**—This allows a greater choice of hybrid maturities and a wider window of opportunity for replant decisions.

- **Better pollination**—It takes place earlier in the summer when temperature and soil moisture conditions are typically more favorable.
- **Better standability**—Early planted corn is usually shorter and has better stalk quality.
- **Pest tolerance**—Early planting often reduces exposure to such insects as flea beetles, billbugs, second-generation European corn borer other late season pests. Early planting can sometimes increase damage from first-generation European corn borer and from

maggots and wireworms. Many plant disease outbreaks, especially foliar and ear diseases, begin as insignificant infestations early in the season, and grow in importance as inoculum accumulates late in the season. Early planting is one practice that can avert these diseases.

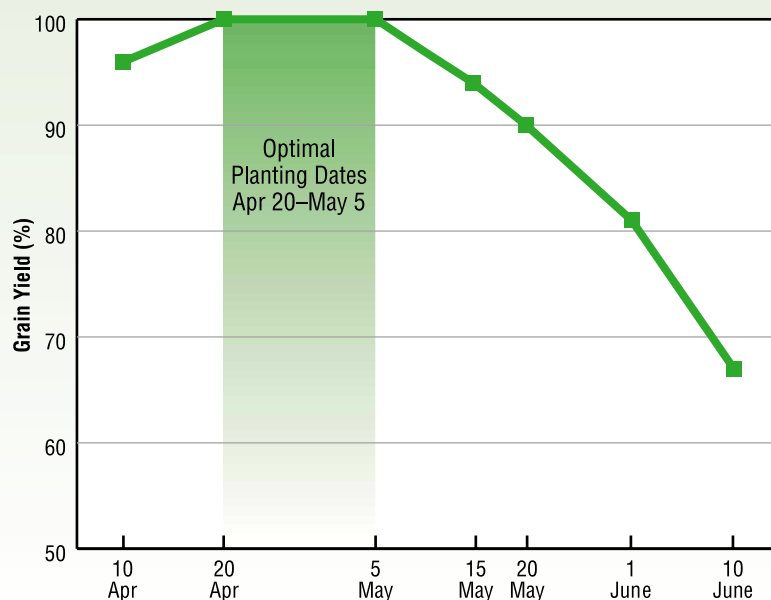
- **Earlier maturity**—The fall brings more time for field drying and higher test weights.
- **Early harvest**—This eases the fall workload and allows for harvesting when weather and field conditions are usually better.
- **A jump on next season**—Fall fertilization and tillage can begin sooner.

Simply stated, early planting increases net returns without adding production costs.

In spite of this, however, early planting does not promise maximum yield, because early spring conditions are usually not favorable for achieving uniform emergence and stand establishment.

**Figure 4 Early vs. Late Planting**

*Yield comparisons of corn planted before and after the optimum corn planting period by an equal number of days show there is a greater yield loss associated with late planting. As a general rule, corn should therefore be planted according to the calendar and not the soil temperature.*



Source: Farnham 1997.

### The Traditional Risks of Planting Early

In early planting situations, the seed is vulnerable to a number of threats because it begins to germinate and emerge too soon, under less than optimum growing conditions. The seed can be subject to fungal pressure and can often result in an unhealthy plant with poor vigor and poor uniformity to the other plants.

Furthermore, the cold weather will slow the emergence and early growth process, thereby extending this period of vulnerability. In fact, emergence can be delayed by two, three or even four weeks compared to the normal rate of five to seven days.

#### Poor Seedling Development

During this prolonged emergence period, seeds may experience extremely cold temperatures, making them more susceptible to chilling injury, which weakens their metabolism and stunts their growth (Figure 5).

#### Figure 5 The High Risk of Chilling Injury

*Chilling injury is the number-one cause of uneven emergence and poor stand establishment. When seeds rapidly imbibe water in cold soil temperatures, they suffer membrane damage that can disrupt normal metabolic processes.*



A lengthy germination process also means the seeds can deplete their own internal food reserves. If seedling roots are not sufficiently established to extract nutrients from the soil or leaves are not sufficiently developed to carry on photosynthesis, this depletion can weaken the seedlings.

The resulting plant stands following such chilling injury and/or nutrient deficiency will be poor—perhaps so poor as to warrant replanting. This translates into a greater expense to the producer and possibly less yield than if the field had been planted later initially.

Even when the population level is adequate, uneven emergence and plant development can cause yield losses of eight to ten percent (Carter, Nafziger and Hicks 1992). Therefore, uneven stands may be too good to destroy, but not good enough for optimum yields.

#### Plant Pathogens

In addition to seedling developmental problems, a number of other factors can contribute to poor corn stands early in the growing season. Several soil-inhabiting fungi, such as Pythium, Fusarium, Diplodia, Rhizoctonia and Penicillium, can cause seed decay and seedling blights.

These fungi may rot the seed prior to germination. Affected seeds are usually discolored and soft, and may be overgrown with fungi. With preemergence seedling blights, the seed germinates, but the seedlings may be killed before they emerge from the soil. With postemergence seedling blights, the seedlings emerge through the soil surface before developing symptoms. Once emerged, they tend to yellow, wilt and die.

## The Impulse to Plant Early

### Other Threats

Insect damage, fertilizer or herbicide injury, and soil conditions, such as water saturation, may also cause or contribute to early season corn establishment problems. Plant death or stunting from such stresses can result in potential yield loss if stands are reduced to less than optimum levels.

### Frost Damage

Early planting may also cause some concern about stand loss or leaf injury due to a late spring frost, but this is usually not a serious problem.

The corn growing point remains below ground for two to three weeks after emergence or until the corn plant is about ten inches tall. At this time, when there are six fully emerged leaves, the stalk begins to elongate. It is this process that moves the growing point above the soil surface.

Because the corn growing point is protected for a considerable period after emergence, lengthy sub-freezing temperatures are necessary to kill the entire plant. Thus, while there may be some leaf loss from a late spring frost, this damage will have little effect on grain yield, although plant development may be delayed.

## Beneath the Surface

### The Natural Germination and Emergence Process

*When corn kernels are planted in moist soil, they absorb moisture and swell. This activates enzymes that digest and move nutrients to the developing embryo. These nutrients are found in the mass of stored food called the endosperm. The endosperm is about 90 percent starch and 10 percent proteins, oils, minerals, etc.*



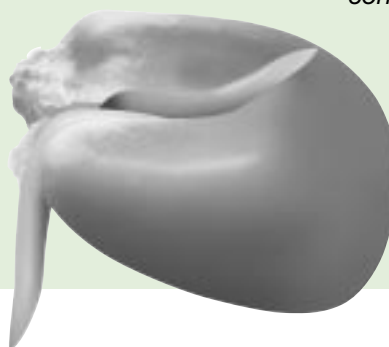
*The embryo is actually a miniature plant within the kernel. It has a radicle (first root) and a plumule (5 to 6 leaves).*

*Growth begins with the emergence of the radicle from the kernel. This is followed shortly by the emergence of the plumule. A tubular modified leaf called the coleoptile, commonly known as the “spike,” covers the plumule and protects it as it penetrates the soil surface.*

*Approximately 100 to 150 GDDs (heat units) are required for the coleoptile to emerge from the soil. Once this occurs, sunlight causes the coleoptile to split open revealing the first leaves of the corn plant. With adequate moisture and warm temperatures, emergence can occur in as few as five to seven days.*

*A cool and dry soil tends to preserve seed health and viability but delays emergence. As long as the soil is cool and dry, the germination process is not initiated. The seed remains dormant, and is basically still in storage.*

*Once the soil is moist enough for the seed to imbibe water, however, the germination process can start, even at temperatures below 50°F. Under these conditions, the process will take time because cool temperatures slow the uptake of water into the seed.*



*During this lengthy germination period, the seed is vulnerable to chilling injury, fungi and other early season threats that can affect its health.*

## Intellicoat—Turning Risks Into Opportunities

**T**he Intellicoat® Early Plant™ seed corn coating is the first technology to allow growers to plant early—and profit from all the advantages of such a practice—with minimal risk of stand loss that can reduce yields. It does this simply by controlling the germination process.

In early spring planting conditions, the coating restricts the seed's ability to imbibe water until the soil is warm enough for healthy germination and seedling development. As a result, germination occurs when it should, under optimum growing conditions.

This promotes more uniform emergence from corn seeds planted before the normal optimum planting period by as many as four weeks. In reality, with the Intellicoat coating, farmers can reliably expand their planting window to get their corn in on time and still achieve full, uniform stands—effectively meeting both objectives to maximizing yield potential.

### *The Coating*

The seed coating polymer called Intellicoat is derived from natural fatty acids (from soybean and corn oils), and is environmentally friendly. This unique, functional polymer coating, which can be used in numerous crop applications apart from corn, has been developed to abruptly change its water permeability when heated or cooled by just a few degrees.

Changing from its impermeable crystalline state to a permeable

amorphous state occurs at a preset temperature that is determined by the physiology of the given crop. This temperature “switch” is precisely set by how the polymer is made.

At that set point, the polymer's ability to change is both reversible and repeatable, thus allowing it to regulate the seed's water uptake. Below the temperature “switch,” the polymer stays in a crystalline state to restrict water. Above the temperature “switch,” it enters an amorphous state to allow water to permeate freely.

The polymer will effectively continue carrying out this function reversibly until the seed has absorbed enough water to germinate.

### *How the Intellicoat Early Plant Corn Coating Works*

In an early plant corn application, the Intellicoat coating temperature “switch” is set at approximately 55°F, the point at which the soil is warm enough for healthy corn seedling growth (*Figure 6*).

Below approximately 55°F, the polymer forms a solid barrier and restricts the corn seed's ability to absorb moisture. Above approximately 55°F, the polymer changes and allows water to permeate and reach the seed so that germination can begin.

With this process taking place, the Intellicoat Early Plant coating works to help ensure the seed will germinate and emerge when the time is right, under optimum growing conditions. This can be anytime after planting, from a few days to as many as four weeks later.

## Intellicoat—Turning Risks Into Opportunities

### The Benefits of Intellicoat Early Plant

Seed corn treated with Intellicoat polymer seed coatings can withstand the harsh conditions associated with early planting and deliver improved results over uncoated seed.

This is because the Intellicoat polymer protects the seed from chilling injury, making sure it remains healthy and ready for strong emergence once soils reach optimal growing temperatures.

With the Intellicoat coating, growers can plant a few days or even as many as four weeks earlier than normal, regardless of ground temperature. When conditions are right, the seeds

emerge, producing more uniform stands and higher populations.

Compared to uncoated seeds planted early, Intellicoat coated seeds have consistently achieved:

- **More uniform emergence**
- **Higher stand counts**
- **Higher yields**

Growers who plant Intellicoat Early Plant Corn and observe the following recommended management practices will enjoy the many benefits of early planting with minimal risks and greater profit potential.

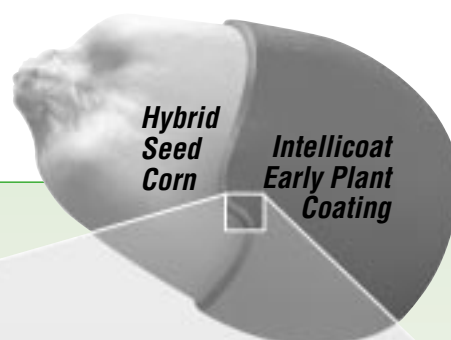
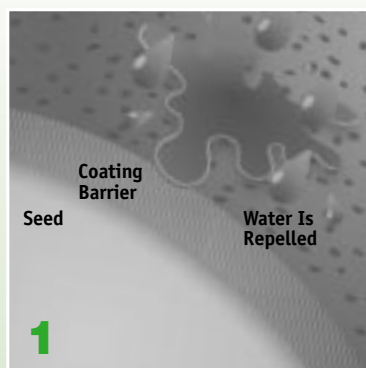
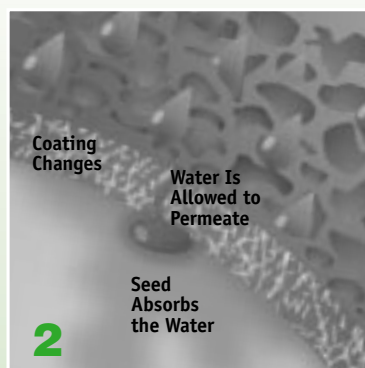


Figure 6 How the technology works



#### **Below 55°F**

As long as the soil temperature is too cold for healthy germination, the polymer maintains a dense crystalline structure around the seed. This forms a barrier between the seed and the moisture in the soil, restricting the seed's ability to absorb water.



#### **Above 55°F**

When the soil warms up, the polymer changes. Its physical structure becomes amorphous, making it permeable to water, thus allowing the seed to absorb the moisture it needs to germinate.

## Planting Considerations

### Planting Date

Intellicoat® Early Plant™ Corn can be planted up to four weeks earlier than normal. Therefore, if soil conditions are dry, begin planting, even if the calendar date is earlier than the optimum period. There is no need to wait for soils to warm up.

When soil temperatures are below 55°F, the polymer prevents the seed from imbibing water and therefore prevents germination. Water uptake and seed germination will not take place until the soil temperature is warm enough for healthy, strong seedling development.

Corn should be planted only when soils are dry enough to support traffic without causing soil compaction. The yield reductions resulting from “mudding the seed in” may be much greater than those resulting from a slight planting delay.

If soil conditions permit, no-tillage fields can be planted at the same time as conventional tillage fields.

### Planting Depth

Depth control is extremely important. Uniformity of planting depth will directly affect uniformity of emergence, especially in dry conditions.

Intellicoat Early Plant coated seeds should be planted 1½ to 2 inches deep. This depth should provide for adequate root development, while placing the seed in a moist environment (*Figure 7*).

Although soil temperatures are likely to be cool in early corn planting periods, germination and emergence will not begin to occur with Intellicoat Early Plant corn until the soil warms to 55°F. For this reason, planting depth adjustments related to soil temperature are not necessary. Maintaining good seed-to-soil contact has the highest priority, and this is often accomplished best when seeding depth is in the 1½ to 2-inch range.

Regardless of soil moisture conditions, avoid shallow plantings that can lead to poor development of the permanent root system. If the crown develops at or near the soil surface, some of the permanent roots may not grow under hot, dry conditions, creating a condition known as the “floppy” or “rootless” corn syndrome.

Adjust press wheels and covering discs to ensure good seed-to-soil contact. Spring pressure may need to be increased in drier soil for adequate soil contact and to help bring moisture to the seed. Decrease spring pressure in moist soils to avoid compacting soil around the seed.

Although most planters have seed population monitors, which allow seed drop monitoring from the tractor cab, there is no monitor for seeding depth or seed-to-soil contact. Therefore, it's extremely important to check seed placement behind the planter, particularly as soil conditions change from field to field or as a result of the weather.

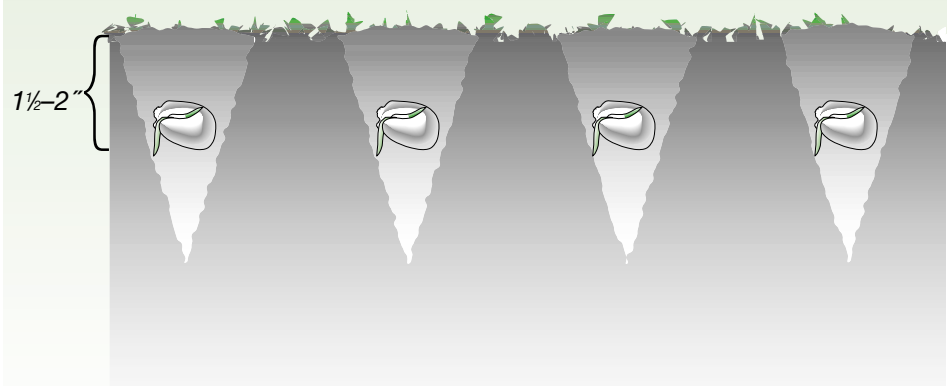
### Seeding Rate

The optimum plant population for a field is determined by many factors, including the growing environment and crop management practices. Most research suggests that planting a hybrid at seeding rates below optimum is usually more likely to cause yield loss than planting above recommended rates (unless lodging becomes more severe at higher population levels).

Seeding rate recommendations for hybrids coated with the Intellicoat Early Plant polymer are identical to those for uncoated seeds, with typical adjustments for seed germination and early planting.

**Figure 7** Maintain the Right Planting Depth

*The most critical planting consideration to promote uniform emergence is uniformity in planting depth. This is particularly true in early planting situations.*



## Recommended Management Practices

For Intellicoat Early Plant corn:

- Plant on the high side of the recommended population range to account for germination or seedling growth losses or tough seedbed conditions, such as reduced tillage.
- Know your general soil and climate conditions, and make adjustments to plant population based on the risk of severe moisture deficiency.
- Follow seed company recommendations to adjust the population for specific hybrids.

### Fungicide Treatments

Intellicoat seed treatments have been designed with an enhanced fungicide package that provides extended protection against early season fungi that could otherwise destroy the seed before or during germination. No further application of fungicide is necessary for optimum performance. A soil-applied insecticide is recommended to protect Early Plant Corn from attack by soil insects, especially when planted very early.

### Planter Adjustment

Seed coated with the Intellicoat polymer has different flow and planting characteristics than raw seed. It is very important to adjust your planter for the Early Plant Corn seed you intend to plant. Check planter calibration again if the temperature changes drastically after initial adjustment.

### Soil Treatments

Low soil temperatures common during early planting slow nutrient uptake and reduce the rate of soil nutrient release. As a result, early vegetative growth is

slow. Row placement of a starter fertilizer stimulates early growth and may increase yields in some areas.

Some starter fertilizer formulations in limited soil moisture conditions may decrease seed germination by increasing salt concentration around the seed. For best results, place the fertilizer two inches to the side and two inches below the seed, never with the seed.

### Pest Management

Management of diseases, insect pest populations and weeds in Intellicoat Early Plant Corn situations requires the same combination of preventive and timely responsive actions that other corn requires.

The recommendation is to follow the same basic pest management practices you conduct in normal corn applications.

### Hybrid Selection

Only those lots of seed with high quality have been selected for application of the Intellicoat Early Plant seed corn coating.

For growers looking to plant early with Intellicoat, there are two primary factors to consider when making hybrid selections—emergence/seedling vigor and maturity.

### Emergence and Seed Vigor

In virtually all cases, selecting for these characteristics will already be addressed by your seed company. Hybrids with the Intellicoat Early Plant seed coating should already possess strong emergence and seedling vigor ratings. Contact your Seed Consultant if you have questions.

### Maturity

Intellicoat Early Plant Corn is available in early, mid- and full season hybrids.

### For Maximum Yield:

Full season hybrids respond especially well to early planting and, because they can use the entire growing season, are recommended when maximum yield is the primary goal.

### For Drier Corn:

Early and mid-season hybrids are generally lower yielding than fuller season products, but contain less moisture at harvest time. They also minimize the risks of immature corn associated with a cool season and/or an early fall frost. If dry corn is the primary goal, mid- and/or early season hybrids may be the best choice for early planting with Intellicoat Early Plant Corn.

### For Greatest Net Income:

Planting a balanced package of early, mid- and full season hybrids and varieties minimizes weather-related risk and generally provides the greatest net income over an extended period of time.

Although the recommended ratio of early, mid- and full season products varies greatly from area to area, most experts recommend a higher percentage of mid-season products and a lower percentage of early and full season products. A common recommendation is 20%–25% early season, 50%–60% mid-season and 20%–25% full season.

Because of the “ultra-early” planting option, made available by Intellicoat Early Plant Corn, this ratio may swing to a higher percentage of full season hybrids in the future.

## Field Selection

The main issues to consider with field selection are soil moisture and temperature, previous crop and tillage.

### Soil Type

Since dry soils warm more quickly than wet soils, early plantings with Intellicoat® Early Plant™ Corn should begin on dry, well-drained, and light-textured (sandier) soils when possible. Avoid early planting on wet, poorly drained, heavy (clay) soils.

### Tillage

Fields with reduced tillage usually contain more moisture than conventionally tilled soils, especially at the surface. The increased moisture is a result of the residue layer that reflects sunlight and insulates the soil from the air. In addition, residue contributes to higher soil moisture by trapping snow and reducing wind speed for reduced evaporation.

### Slope Characteristics and Organic Matter Content

These factors also affect soil temperature and should be used as a field selection criterion whenever possible. South-facing slopes receive more energy from the sun and warm faster than north-facing slopes or level areas. Soils higher up on slopes are usually drier than soils in lower areas and usually warm faster. Similarly, soils low in organic matter tend to hold less moisture and may warm faster than soils higher in organic matter.

### Crop Rotation

Although Intellicoat Early Plant coated seed can be used in a corn-after-corn system, whenever possible, take advantage of crop rotational benefits when planting early.

### Soil Compaction

Cloddy seed beds and soil compaction contribute to uneven stands. This is because root development, especially depth of rooting, can be dramatically restricted when compacted tillage layers exist. A shallow root system in turn undermines the crop's ability to tolerate drier soil conditions later in the summer.

The primary cause of soil compaction is excessive tillage. Therefore, avoid working wet soil and decrease the number of secondary tillage passes. You should only perform secondary tillage operations when necessary to prepare an adequate seedbed.

If possible, a minimum or no-till system is recommended because of the proven advantages in terms of compaction and erosion. The benefits of Intellicoat Early Plant technology can be more pronounced in this type of system because of the added time it takes for a no-till field to warm up in the spring.

## Important Intellicoat Early Plant Guidelines

The Intellicoat Early Plant seed corn coating will go a long way to minimize the risks associated with planting in early spring. However, several other planting considerations that further enhance the value of the technology:

1. Select fields with good drainage.
2. Avoid tilling or planting when soils are too wet and compaction is likely.
3. Maintain proper seeding depth and good seed-to-soil contact to minimize the effects of soil drying, bird and rodent feeding and uneven planter depth control.
4. Apply starter fertilizer to stimulate early growth.
5. Use a soil-applied insecticide with early planted corn to protect the seed from lengthy exposures to insects and diseases.

## Conclusion

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**Intellicoat Early Plant** corn technology has been proven successful in more than three years of on-farm and university field trials conducted in a wide range of environmental conditions. In the past two years, it has been tested commercially on 600 farms across 20,000 acres in 21 states.

Data gathered from these tests consistently reflects the coating's ability to control germination for optimum emergence uniformity, higher stand counts and higher yields in early planting situations.

Corn growers who have participated in the trials have already seen for themselves how Intellicoat Early Plant seed corn coating technology can reliably expand the planting window.

Today, with Intellicoat, growers can plant early with minimal risk to:

- Achieve optimum emergence uniformity and stand counts—even in no-till.
- Avoid late planting.
- Maximize yield.
- Spread workload.
- Finish corn planting early enough to get a jump on planting soybeans.
- Potentially reduce drying costs.
- Make more efficient use of labor and equipment.

Incorporating Intellicoat Early Plant Corn into your program with the assistance of your professional Seed Consultant and under the recommendations offered by this reference guide promises to increase your overall profit potential as well.

Intellicoat Early Plant Corn is now widely available commercially to all corn growers for the 2003 growing season.

For hybrid information, call our hybrid seed partner, Fielder's Choice Direct, at:

**1-800-321-3177**

For more information about the technology, visit our website at:

**landecag.com**



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### Website Links

For more information, visit:

LandecAg at [www.landecag.com](http://www.landecag.com)

Purdue University, Department of Agronomy at [www.agry.purdue.edu](http://www.agry.purdue.edu)

The Purdue University Agronomy Extension Page at [www.agcom.purdue.edu/AgCom/pubs/agronomy.htm](http://www.agcom.purdue.edu/AgCom/pubs/agronomy.htm)

The National Corn Growers Association at [www.ncga.com](http://www.ncga.com)

The Ohio State University Agronomy Guide (Corn Production) at <http://ohioline.osu.edu/b472/corn.html>

Iowa State University College of Agriculture at [www.ag.iastate.edu](http://www.ag.iastate.edu)

The National Climatic Data Center (NCDC) at <http://lwf.ncdc.noaa.gov/oa/ncdc.html>

United States Department of Agriculture at [www.usda.gov](http://www.usda.gov)



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