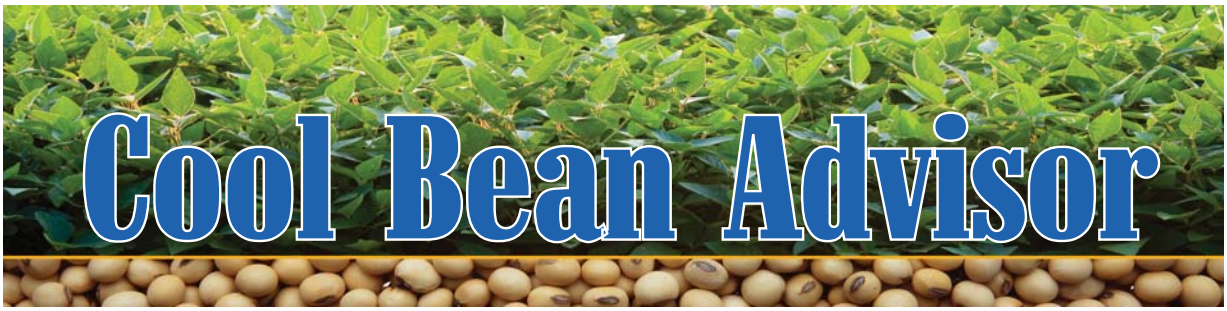


UNIVERSITY OF WISCONSIN AGRONOMY, SOYBEAN RESEARCH, UNIVERSITY OF WISCONSIN-EXTENSION

Predicting When Soybeans Will Emerge

Shawn P. Conley, State Soybean and Wheat Extension Specialist
John Gaska, Outreach Specialist
University of Wisconsin, Madison

Ten years ago, very few people outside of academia were concerned about the number of growing degree units (GDU) required for soybean emergence. Today however, things are dramatically different. The main drivers for this change are earlier planting dates, decreased seeding rates, and increased seed costs. In a recent grower survey (2008) conducted with cooperation and support from the Wisconsin Soybean Marketing Board (WSMB), we found that 40% of Wisconsn growers are planting one week earlier and 27% are a full two weeks earlier today than they were ten years ago (Table 1). In terms of calendar date, 38% of all growers started planting soybean by May 7th and 81% by May 15th (Table 2). These fundamental changes have considerably altered the environment in which soybean seed is placed.

Table 1.Wisconsin planting date shift over the last decade (N = 169).

Planting date shift	Percent of growers
One week earlier	40%
Two weeks earlier	27%
Three weeks earlier	4%
Later by one week	1%
No change	28%

Table 2.Average start date for soybean planting in Wisconsin based on individual farm data (N =149).

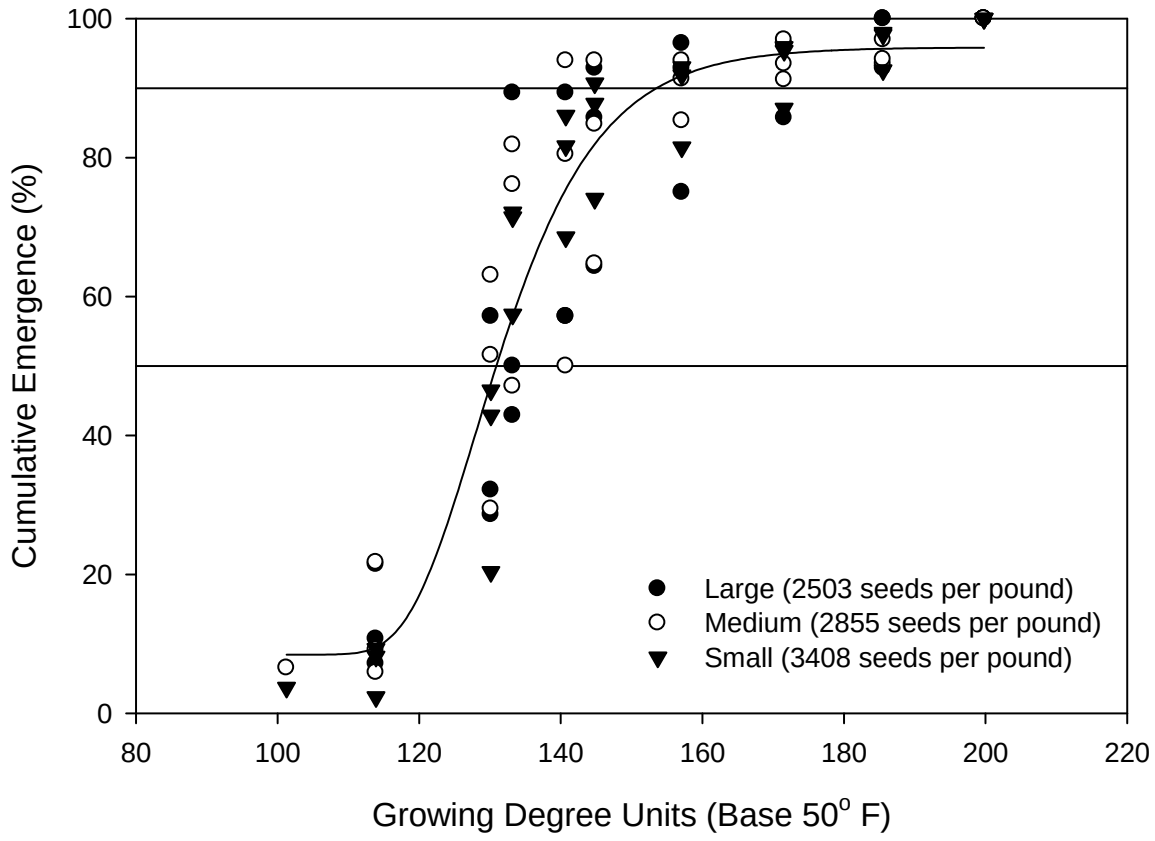
	Planting Date (% Start)				
Acreage	Before May 1st	May 1 – May 7	May 8 – May 15	May 16 – May 22	After May 22
< 100	6	27	39	24	5
≥ 100	8	36	47	9	0
Average	7	31	43	17	3

As growers drop fewer soybean seeds earlier every year, replant questions may become even more common. Before making any decisions to replant a field due to poor emergence, we must first understand the minimum GDU's required to make such a call. To try to understand the relationship of GDU's and soybean emergence, we intiated an experiment to characterize the effect of seed size on soybean emergence and yield, while also measuring GDU's needed for emergence.

In this experiment, we selected 7 high yielding, glyphosate tolerant soybean varieties and separated the seed from those varieties into three distinct seed sizes by passing conditioned seed over three seive sizes. Each variety was then grouped by an arbitrary small, medium, and large seed size label (Figure 1). All seed was treated with ApronMaxx® fungicide prior to planting to minimize the risk of disease incidence. The experiment was planted at four locations in 2008 and 2009 in WI and IA. At planting, Tidbit temperature probes were placed at the seeding depth of 1 inch to monitor soil temperature through emergence. Plots at Arlington WI were monitored daily for emergence.

Regression analysis from 2008 data for one of the varieties, DSR-2600/RR, indicated that 50% emergence occurred at 130 GDU's (range 130 to 140) and 90% emergence occurred at 155 GDU's (range 134 to 178) (Figure 1). Similar results were noted with the other varieties.

Figure 1. Cumulative soybean emergence based on soil temperature growing degree units (base 50° F).



While we are still working through this data to develop clear GDU based replant decisions, the preliminary data will hopefully provide growers and agronomists a ballpark from which decisions can be made in 2010. ***For reference please see Figure 2 to see soil temperatures at Arlington WI from 4/10 to 4/30/10.*** In addition to replant decisions growers and agronomists can use this information to predict when to apply (or not apply) pre-emergent and post-emergent herbicides to avoid crop injury. Lastly, given the calendar date as related to replanting soybeans, growers can make more informed decisions about what RM varieties to plant.

Figure 2. Daily soil temperatures at Arlington WI. from 4/10 to 4/30.