**BSEN 5250/6250**

**Lab 8: Simulating Corn Phenology**

Corn development rate is driven by temperature. Temperature can be simulated using the growing degree concept. Growing degree days (GDD) occurring on a particular day (t) can be computed by

If GDDt > 36 then GDDt = 36

If GDDt < 0 then GDDt = 0

Where Tmax and Tmin are the maximum and minimum temperature for day t in units of oF.

Cumulative GDD from planting can be computed by

where CGDD is the cumulative growing degree days from planting summed over all days.

When the cumulative GDD reaches a threshold, either flowering or physiological maturity occurs. Table 1 shows the cumulative GDD from planting to silking and planting to physiological maturity for a short, medium and long season Pioneer corn hybrid. The short season hybrid requires fewer GDD to silking and maturity than the long season hybrid.

|  |  |  |
| --- | --- | --- |
| **Hybrid** | **GDD to Silking** | **GDD to Maturity** |
| P0157 | 1270 | 2450 |
| P0969AM | 1320 | 2580 |
| P2089AM | 1450 | 2910 |

Source: <https://www.pioneer.com/home/site/us/products/corn/seed-guide/>

**Exercises**

Answer the questions below and upload your answers and excel spreadsheet to Canvas. The template for the lab is Lab 8-Simulating Corn Phenology.xlsx.

1. In Alabama, the typical planting date for corn is April 1. Assuming this planting date, compute the day that silking and maturity occurs for each of the three hybrids using weather data for 1998 in Shorter, AL in the spreadsheet template.

|  |  |  |
| --- | --- | --- |
| **Hybrid** | **Silking Date** | **Maturity Date** |
| P0157 |  |  |
| P0969AM |  |  |
| P2089AM |  |  |

2. The typical planting date for corn in Iowa is May 1. Assuming this planting date, compute the silking day and maturity day for each of the three hybrids using 1990 weather data for Johnson, Iowa in the spreadsheet template.

|  |  |  |
| --- | --- | --- |
| **Hybrid** | **Silking Date** | **Maturity Date** |
| P0157 |  |  |
| P0969AM |  |  |
| P2089AM |  |  |

3. Explain the results that you found in question 1 and 2.