Pepper (*Capsicum annuum*)

Summary of models (Table 1) and analysis led by Heather Stoven, Nick Andrews, Hiedi Noordijk, and Len Coop, Oregon State University (OSU).

Methods: Using events monitored in the field, the lowest error (C.V. or coefficient of variation) was used to determine lower and upper threshold temperature values based on, depending on variety, between 7 and 10 site-years, all from the Willamette Valley of Western Oregon (2013-2015). Varieties included: "Stocky red roaster", "Gatherer's gold", "King Arthur", and "Bell King". Sites included the OSU Vegetable Farm (near Corvallis, OR), the OSU NWREC research farm (near Aurora, OR), Gathering Together Farm (near Philomath, OR), and other farms depending on variety and year. Degree-day values calculated by the default method (Baskerville-Emin single sine formula) using the online calculator at uspest.org.

The main model interval used to determine thresholds for most varieties was from transplant date (4 to 7 true leaves) to first ripe harvest (when the median plant has 4 mature fruit; red, green, or yellow depending upon variety)(Table 1).

Results: The final pepper phenology models all were determined by lowest C.V. (Table 1) to use lower thresholds of 52°F (11.11°C), upper thresholds are nominal: could not determine consistent upper thresholds so using 104°F (40.0°C), and single-sine degree-day calculations with a horizontal upper cutoff method. Degree-day models for the 4 transplant varieties had lowest C.V. values between 1.9 and 3.8, versus models using average number of days with C.V. values between 6.2 and 8.7. The mean absolute deviations (MAD) using average DDs ranged from 2.0 to 11.7 days.

Using the Models: Models are available at the OSU Integrated Plant Protection (IPPC) website http://uspest.org/dd/model (select nearest weather station using Google map; select "CROPTIME models" at "Model Category" (first) pulldown menu; select any of the listed pepper models using the "Model:" pulldown menu). Enter up to 4 start dates (transplant date for these pepper varieties), end date (any date after expected last harvest date), and forecast type. Use either model preview on same page or click on button for full model output. New charting output compares all forecast types showing a reasonable range of expected harvest dates. Other options available (not described here).

Table 1. Lowest Coefficient of Variation (C.V.) model summaries for pepper varieties grown in Western Oregon, 2013-2015.

Degree-days (in Fahrenheit) for transplanted (4-7 true leaves) pepper varieties
52/100F SSHCO (52 F lower thresh, 100 F upper thresh, single sine, horiz. cutoff DDs)

Variety & model abbreviation	Data sets (site-yrs)	Fruit set		First green harvest		First ripe harvest (median 4 color-ripe peppers/plant)			
		Avg DDs	Avg Days	Avg DDs	Avg Days	Avg DDs	% CV	Avg Days	Mean abs. dev. (days)
Stocky red roaster (ppsr)	10	586	42.4	1211	77.4	1682	3.1	105	2
Gatherer's gold (ppgg)	9	575	39.3	1212	78.7	1692	3.4	104	3.4
King Arthur (ppka)	6	608	39	1321	77.3	1767	3.9	107	11.7
Bell King (ppbk)	7	739	42.6	1447	84.1	1998	1.9	128	5.4