Hairy nightshade (*Solanum sarrachoides*).

Model summary (Table 4) and analysis led by Aaron Heinrich, OSU CSS Dept., with assistance from Ed Peachey, Nick Andrews, Hiedi Noordijk, and Leonard Coop, Oregon State University. CROPTIME project funded by USDA-Western SARE.

Methods: Using events monitored in the field, the lowest C.V. (coefficient of variation) was used to determine lower (Table 2 & Fig. 1) and upper (Fig. 2) threshold values based on 8 site-years, all from the Willamette Valley of Oregon (2013 n=3; 2014 n=3; and 2015 n=2). Sites (Table 1) included the OSU Vegetable Farm (near Corvallis, OR), Gathering Together Farm (near Philomath, OR), and the OSU NWREC research farm (near Aurora, OR). 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 was from cotyledon stage to first germinable seed (the date when 1 or more seed germinated following treatment with gibberellic acid and incubated in the dark at 30°C) (Table 2). Thresholds were also checked for cotyledon to flowering, and flowering to 1st germinable seed (Figs. 1 & 2).

Table 1. Field results for main interval (cotyledon to first germinable seed).

Selected Event:	Year	Site	Field	Weather station	Start date	End Date	Days
Cotyledon to first	2014	GTF		CRVO agrimet	5/18/14	7/31/14	74
germinable seed	2014	VF	Pop-up	CRVO agrimet	5/23/14	7/28/14	66
	2014	VF	Fum	CRVO agrimet	6/9/14	8/4/14	56
	2013	VF	A7	CRVO agrimet	6/21/13	9/3/13	74
	2013	VF	A8	CRVO agrimet	5/21/13	8/9/13	80
	2013	47th		ARAO agrimet	5/31/13	8/12/13	73
	2015	VF	A18	CRVO agrimet	23-May	7/24/15	62
	2015	VF	EF	CRVO agrimet	2-Jul	8/26/15	55

Table 2. Summary of lowest C.V. (Tlow=40F and Tupper=95F) for hairy nightshade.

Growth interval	Mean (d)	Range (d)	CV for days (%)	Mean (DD)	Range (DD)	CV for DD (%)
Cotyledon to flowering	32	22-44	25.1	766	607-937	20.3
Flowering to 1st germ	36	30-42	11.9	1076	940-1231	9.7
Cotyledon to 1st germ	68	55-80	13.6	1811	1541-2005	11.4
Lower 95% CI				1668		
Upper 95% CI				1954		

Table 3. Cumulative DD from cotyledon to vegetative growth stages.

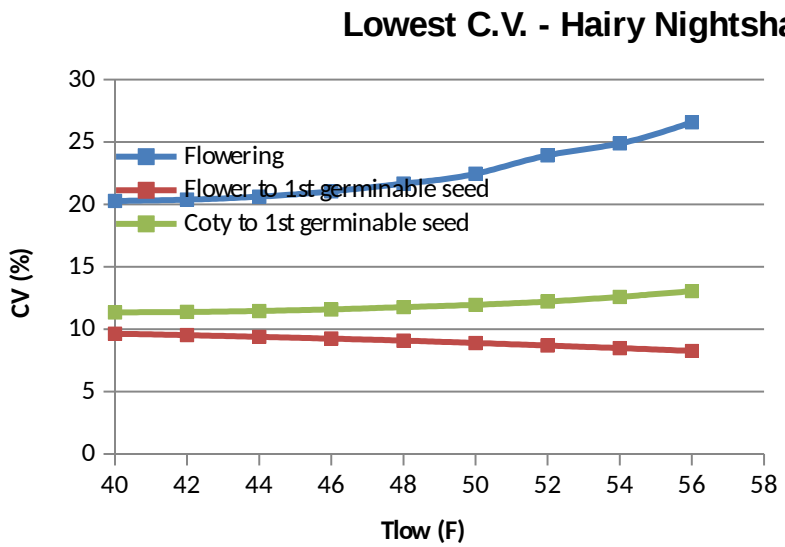
Growth stage from cotyledon	Cum. DD
2 leaf	169
4-5 leaf	325
6-7 leaf	506

Table 4. Degree-Day Model Summary.

Model:	Hairy Nightshade, *Solanum sarrachoides*	
Calculation method:	Single sine (Baskerville-Emin)	
Tlow:	40°F	22.2°C
Tupper:	95°F	77.2°C
Region of known use:	Willamette Valley, Western Oregon	
Validation status:	New research model based on 8 site-years	

Events table	**DDs (F)**	**DDs (C)**
0. Cotyledon (start)	0	0
1. 2 leaves present	169	94
2. 4-5 leaves present	325	181
3. 6-7 leaves present	506	281
4. First flowering	766	426
5. First germinable seed (lower 95% CI)	1668	927
6. First germinable seed (mean)	1811	1006
7. First germinable seed (upper 95% CI)	1954	1086

Figure 1. Lowest C.V. used to determine Tlow (low temperature threshold) for hairy nightshade.



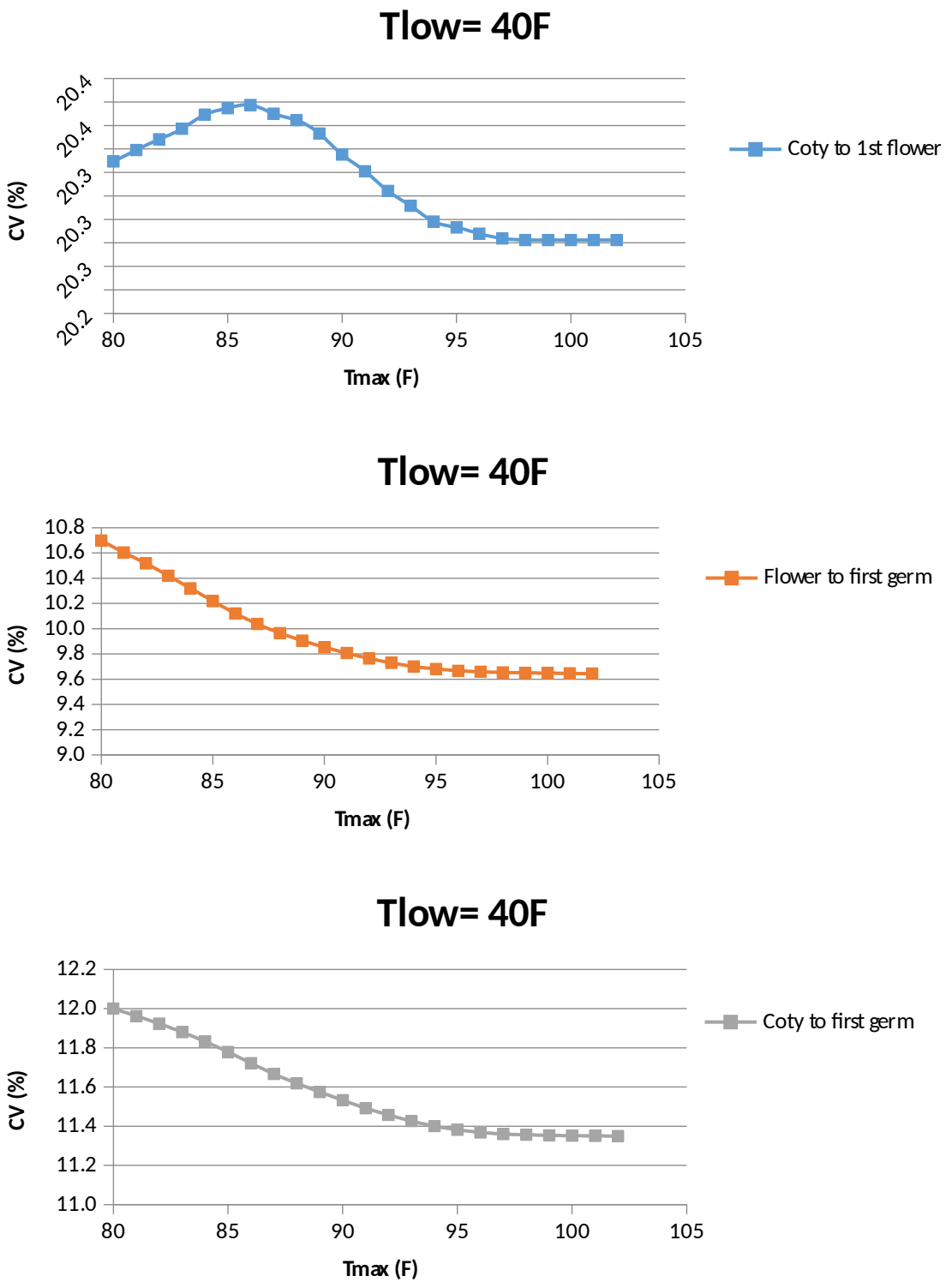


Figure 2. Lowest C.V. to determine Tupper (upper temperature threshold) at Tlow=40F for: (top) – cotyledon to first flower; (middle): first flower to first germinable seeds; (bottom): cotyledon to first germinable seeds.