

## Oregon IPM Center Phenology/Degree-Day Model Implementation – June 20, 2025

Douglas-fir twig weevil

*Cylindrocopturus furnissi* Buchanan (Coleoptera: Curculionidae)

Implementation of the WSU model published 2024



Larva – Ken Gray Photo Collection



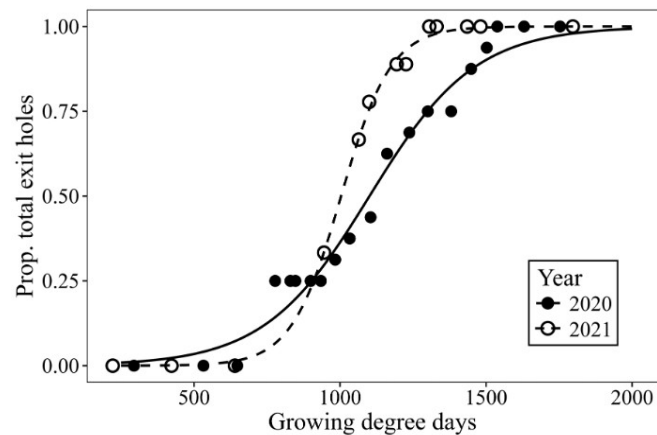
Adult – Ken Gray Photo Collection



Injury – Ken Gray Photo Collection

Pest of: Douglas fir, (*Pseudotsuga menziesii*), true firs (*Abies* spp.)

Source 1. Whitney, T. D. and G. Chastagner. 2024. Insecticide efficacy and emergence timing of the Douglas-fir twig weevil J. Econ. Entomol. 117:942-950.  
<https://doi.org/10.1093/jee/toae048>



**Fig. 6.** Observed (points) and predicted (lines) growing degree days according to percent *C. furnissi* emergence (i.e., proportion of total exit holes observed) for 2020 and 2021. Degree-day model predictions were generated from 2-parameter logistic regressions.

### Data from text and Table 3:

% adult emergence	Toledo WA		(partial validation data) Tayuha St. Forest WA	Avg (Toledo)	Avg (all)
	2020	2021	2020		
10	704	816	623	760	714
50	1101	1003	1025	1052	1043
90	1497	1190	1428	1344	1372

### Check: calculate Dds using nearby weather stations

	Toledo observed (fitted) dates	Est.w/Sta D8787 (nearest to Toledo WA)		Est.w/Sta TR95087 (2nd nearest to Toledo WA)		Est w/Sta E3683		Est w/Sta CLSW1	
		2020	2021	2020	2021	2020	2021	2020	2021
10	07/04/20 06/26/21	625	624	857	850	638	624	853	813
50	07/16/20 07/03/21	744	772	1019	1018	776	781	1008	984
90	08/11/20 07/13/21	1119	906	1485	1196	1180	931	1468	1167
		results: very poor match! elev: 450		results: very good match! elev: 215		results: very poor match! elev: 510		results: very good match! elev: 262	

Results: the two nearest weather stations at lower elevations had similar DD accumulations for dates of emergence, the two higher elev stations had less DD accums., so although the elevation of the studies was not reported, the nearby town of Toledo has a reported elevation of 207 ft. Therefore, this check of reported DDs seems to check out well, helping to verify that the temps recorded for the study were similar to nearby “standard” weather stations.

To be a bit conservative, I will use 715 DD rather than the two year avg of 760 DD for 10% emergence, as the test or validation site had early (623 DD) observation for this event.

### Model Summary

Species: *Cylindrocopturus furnissi* Buchanan

Common Name: Douglas-fir twig weevil

Country of Origin, data from: W. WA (Whitney and Chastagner 2024)

Pest of: Douglas fir, true firs

Validation Status: Developed from two seasons in W. WA

	Celsius	Fahrenheit
Lower Threshold:	10.0	50.0
Upper Threshold:	40.0	104.0
Calculation Method:	Single sine	
Model Start:	1 Jan	

Degree-Day Requirements	Celsius	Fahrenheit
10% adult emergence	397	715
50% adult emergence	583	1050
90% adult emergence	747	1345