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A GROWTH STAGE AND HEAT-UNIT MODEL FOR

# *Hedysarum boreale*

Michael D Peel, Blair L Waldron, Ivan W Mott, and Scott Walker

**ABSTRACT**

A system for staging sweetvetch (*Hedysarum boreale* Nutt. [Fabaceae]) through vegetative and reproductive plant development was established that corresponds with a heat unit or growing degree day (GDD) model. This framework designates 14 finite stages, V1 through V6 (pre-flowering or vegetative), and R1 through R8 (reproductive stages). The arrangement provides meaningful designations for management of the plant for seed production. Of 5 base temperatures tested in the development of the GDD model, 40 °F (4.4 °C) most accurately predicted the growth of sweetvetch through the 6 vegetative and 8 reproductive developmental stages. The GDD model showed that on average, each growth stage above V2 (pre-bud, 2 visible nodes) requires 118 GDD. Critical stages in the development of sweetvetch for seed production are late bud, flowering, pod formation, and seed maturity, which require 605, 841, 1076, and 1547 GDD, respectively. The proper application of this staging system and model can be useful for seed producers and collectors by providing an estimate of when the plant will reach critical growth stages, particularly for management of irrigation, insect pest control, and harvest. Historical temperature data could be used to predict the average calendar date when sweetvetch will reach a given growth stage, or where real-time data are available, dates of stages may be accurately predicted.

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**KEY WORDS**

sweetvetch, growing degree days (GDD), growth, development

**NOMENCLATURE**

Plants: USDA NRCS (2010)

Insects: ITIS (2010)

Photos by Michael Peel