

Peony Phenology in Alaska

by

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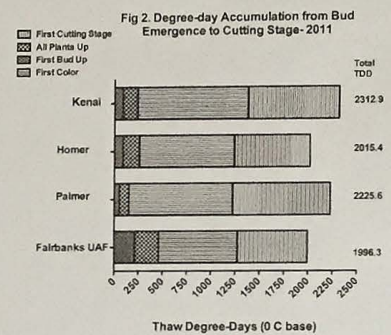
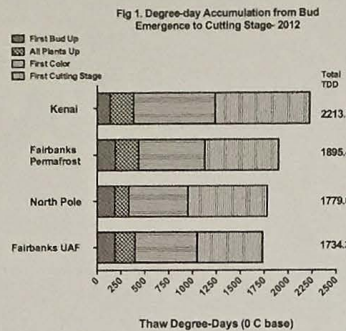
Introduction

Alaska's peony industry stretches from Fairbanks to Homer, east to Tok and Delta Junction and West to Naknek. The area is huge, the climate is diverse, and the growing conditions are varied and challenging. This diversity allows Alaska peony growers to fill a three-month void in the specialty cut flower market by having peonies available from July through September. Elevation differences at sites, especially Homer, allow for local diversity that also stretches the season.

Peony growers were interested in identifying just how diverse this state is and how measurable climatic conditions such as air temperature influence these differences. They are also interested in learning if phenological markers such as bud emergence and first color, etc. can be used in relation to thaw degree-day accumulation to predict bloom times.

This study is a long-term project. Meaningful data can only come from at least 10 years of data. The purpose of this poster is to show some preliminary trends from two years of data.

Thaw Degree-days



Methods

We installed Hobo dataloggers at 10 peony farms around the state and asked growers to note the date of the following phenophases: first bud emergence on one of five 'Sarah Bernhardt' peonies; bud emergence on all five plants; date of first color; and date of first cutting. Data were compiled for all sites, and simple comparative graphs were compiled. Data sets are too few for complete modelling.

Results

Thaw degree-days (TDD) are a measure of heat accumulation over the season. The greater the degree-days, the warmer the daily air temperature. The degree-day accumulation at the sites (Figs 1 and 2) are remarkably similar across the state. The number of degree-days accumulated for each phenophase (first cutting, first color, etc.) is also similar across sites. These data hint that we will be able to use degree-days in modeling peony growth. In the future, growers might be able to predict bloom times by the number of days or TDD after bud emergence.

The number of days within each phenophase differed radically among sites (Figs 3 - 4). The hotter Fairbanks sites completed bud emergence to flowering in as little as 32 days, while the cooler coastal and south central sites took more than twice as long.

Early season bud emergence occurred in mid to late May at each site (Table 1). The biggest difference occurred in the time between bud emergence on all plants and first color (Figs 3 - 4). Flowers growing in south central and coastal Alaska took up to four times longer to reach the first color stage than those in the Interior. These data show that peonies are strongly influenced by air temperature. With a few more years of data, we may be able to predict bloom times very early in the season by calculating degree-day accumulation.

Days for Each Growth Stage

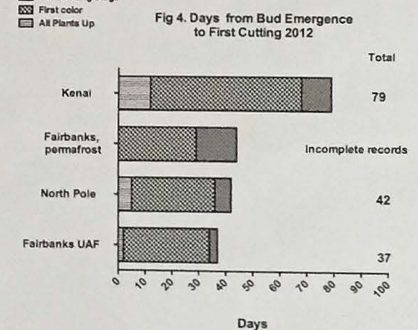
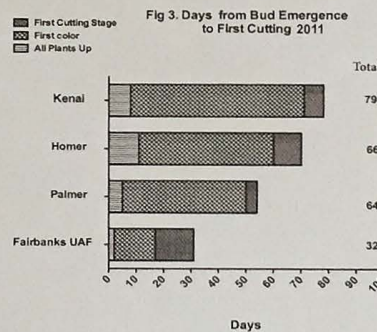


Table 1	2011	2012
First Bud Emergence	May 23	May 22
All Plants with Buds Up	May 25	May 24
First Color	June 10	June 25
Cutting Stage	June 24	June 28
Site	Fairbanks UAF	Fairbanks UAF
Site	Palmer	North Pole
Site	Homer	Fairbanks-permafrost
Site	Kenai	Kenai
First Bud Emergence	May 9	May 25
All Plants with Buds Up	May 14	May 30
First color	July 8	June 30
Cutting Stage	July 12	July 6
Site	Homer	Fairbanks-permafrost
Site	Kenai	Kenai
First Bud Emergence	May 9	May 19
All Plants with Buds Up	May 20	May 31
First color	July 4	July 1
Cutting Stage	July 14	July 15
Site	Kenai	Kenai
First Bud Emergence	May 19	May 19
All Plants with Buds Up	May 27	May 31
First color	Aug 17	July 26
Cutting Stage	Sept 4	Aug 6

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Thaw Degree-days

Fig 1. Degree-day Accumulation from Bud Emergence to Cutting Stage- 2012

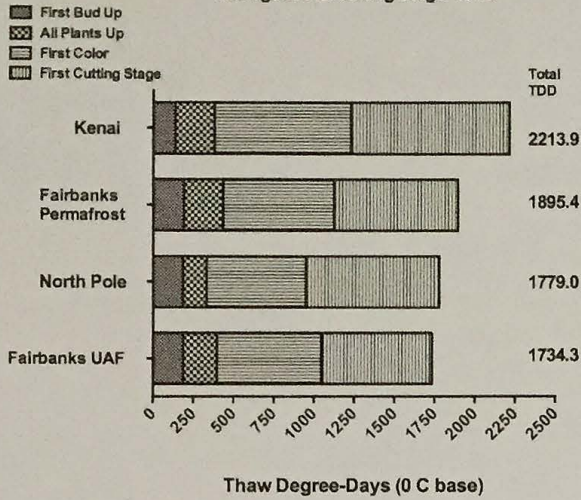
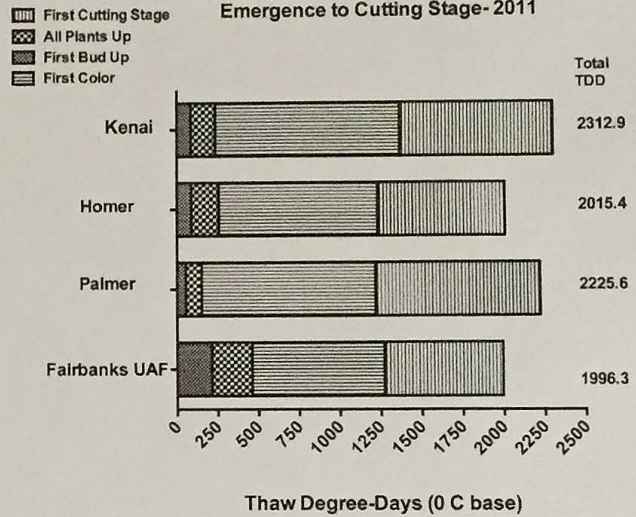


Fig 2. Degree-day Accumulation from Bud Emergence to Cutting Stage- 2011



Days for Each Growth Stage

Fig 3. Days from Bud Emergence to First Cutting 2011

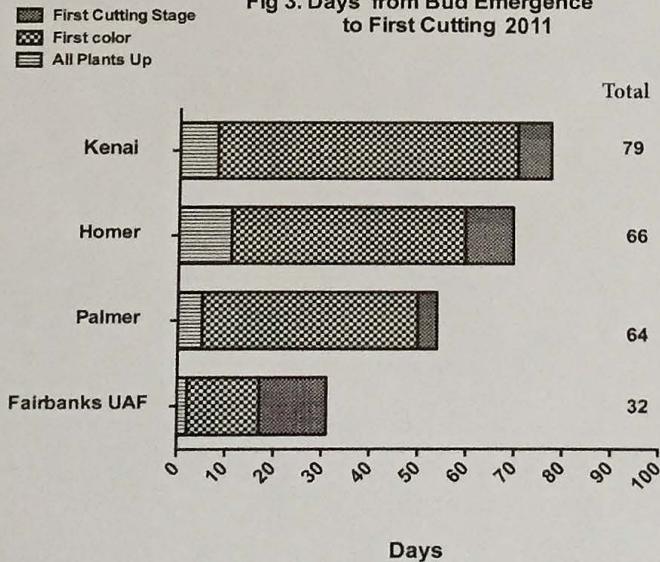


Fig 4. Days from Bud Emergence to First Cutting 2012

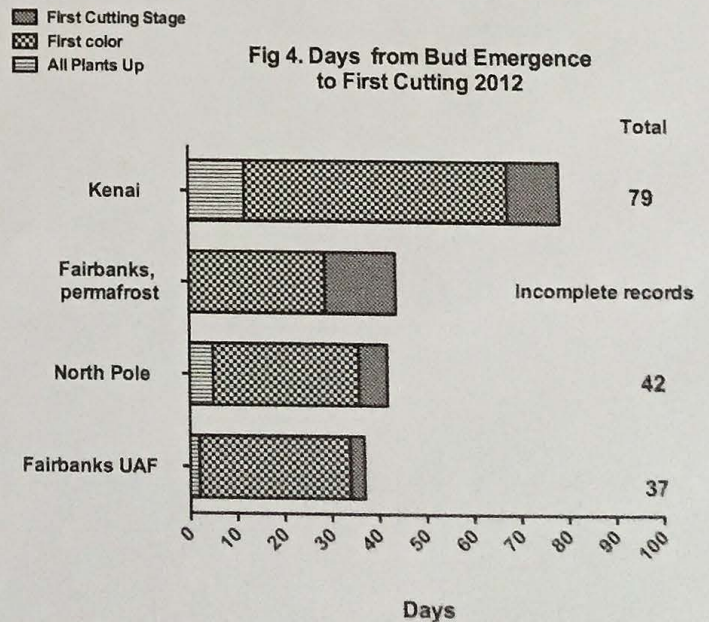


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Palmer	May 9	May 14	July 8	July 12	
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2012	First Bud Emergence	All Plants with Buds Up	First color	Cutting Stage
Fairbanks UAF	May 22	May 24	June 25	June 28
North Pole	May 25	May 30	June 30	July 6
Fairbanks-permafrost		June 2	July 1	July 15
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