



Potato Progress

Research and Extension for Washington's Potato Industry

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Accumulated Heat Units for 2009: Another Cold Spring

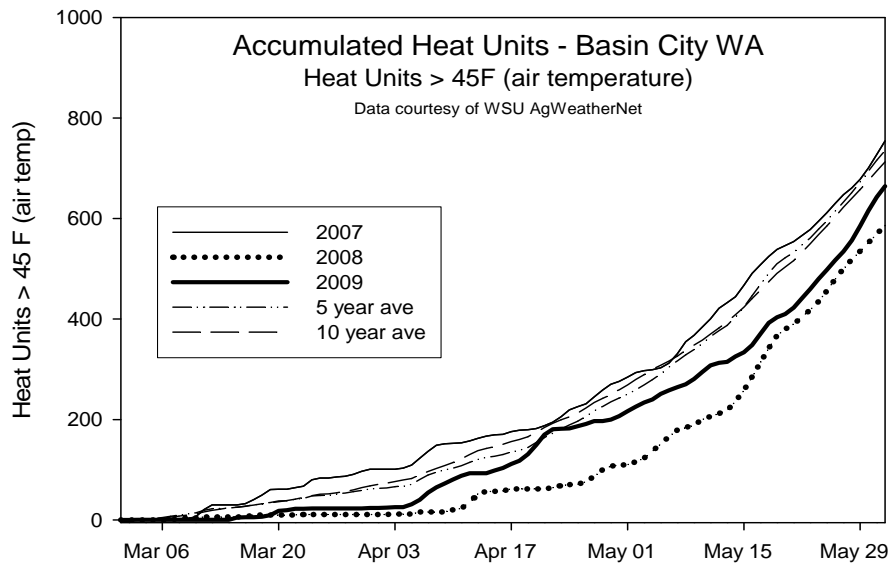
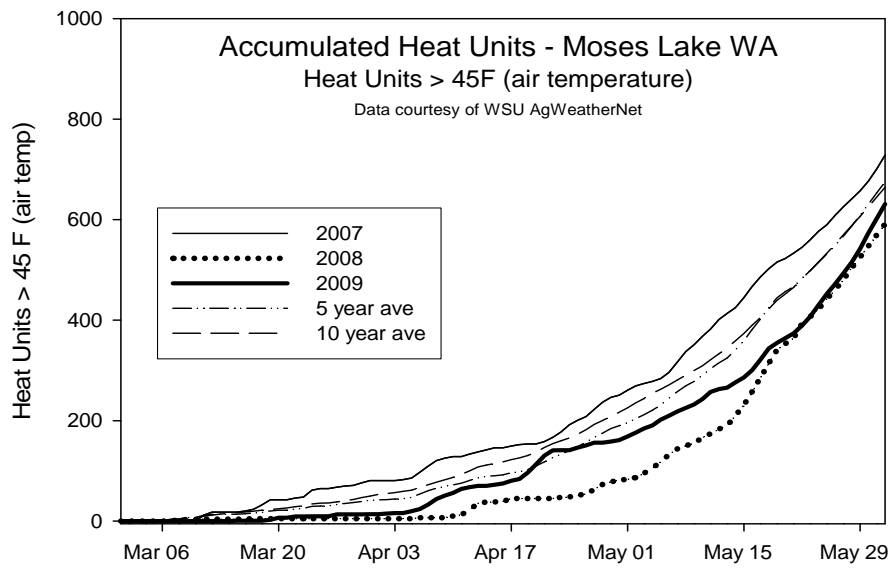
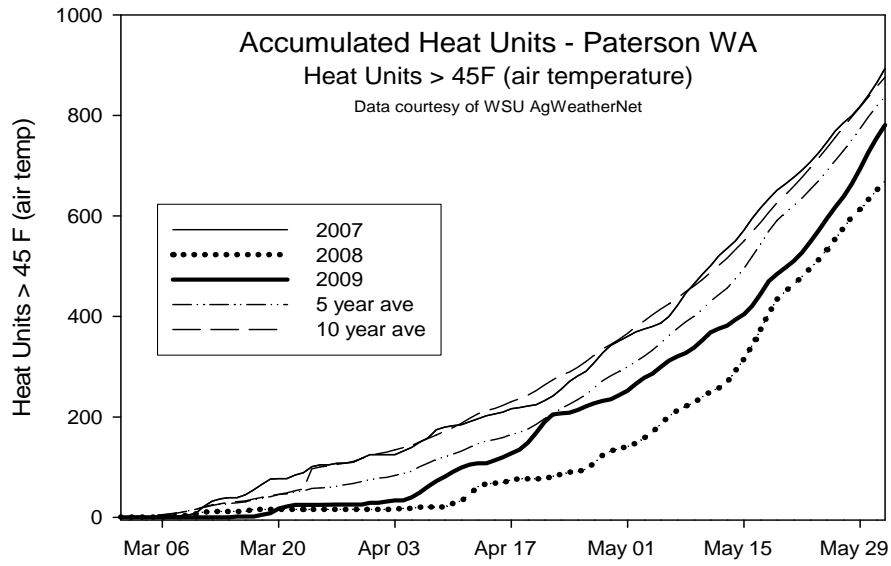
Zachary J. Holden and Mark J. Pavek
Washington State University

In a typical year, ambient heat units >45 F across the Columbia Basin begin to accumulate in early to mid March. This year heat units didn't start to rapidly accumulate until the first week of April - approximately three weeks behind the ten year average (see Figures below). During April, temperatures were conducive for potato growth and the heat unit values were closing in on the five and ten year averages. Cool temps during late April and May slowed heat unit accumulation and potato growth to levels at or slightly above last year. Overall, March to May heat units were significantly higher than those in 2008 but well below the five and ten year averages. In short, this year's planting-to-emergence interval during the bulk of the WA planting season was below normal and early post-emergence growth was compromised.

Potatoes typically emerge between 25 and 40 days after planting in the Basin. Of course, this is dependent on many factors. Soil moisture and temperature are most commonly cited as the major factors that contribute to potato sprout growth and emergence rate. Additional factors include seed size and health, sprout health, sprout/eye location on the mother seed tuber, soil fertility, cultivar, mother-tuber physiological age, volume and mechanical resistance of soil, and seed tuber dormancy. Rapid sprout emergence can promote early-season disease resistance in potato shoots and stems and allow plants to capture solar radiation early in the season. It is important to note, however, that early emergence does not always equate into an increase in yield and can leave some plants vulnerable to an early season frost.

Accumulated heat units, also known as day-degrees and degree-days, are often used to demonstrate or predict sprout emergence. They are calculated by taking the average daily temperature from each day and subtracting the growing base temperature (45 F). The heat units for each day are then added over time to provide accumulated heat units (see figures below). Although potatoes can form sprouts near 40 F, growth is extremely slow. To calculate accumulated heat units, we used a base temperature of 45 F because it is generally more conducive for vegetative growth.

The amount of heat units required in the soil for sprouts to break the soil surface depends on all the factors above and changes for each situation. In general, the faster heat units are accumulated, the quicker plants will emerge. The figures below were calculated with above-ground (ambient temp) heat units. Best wishes for the remainder of your growing season!

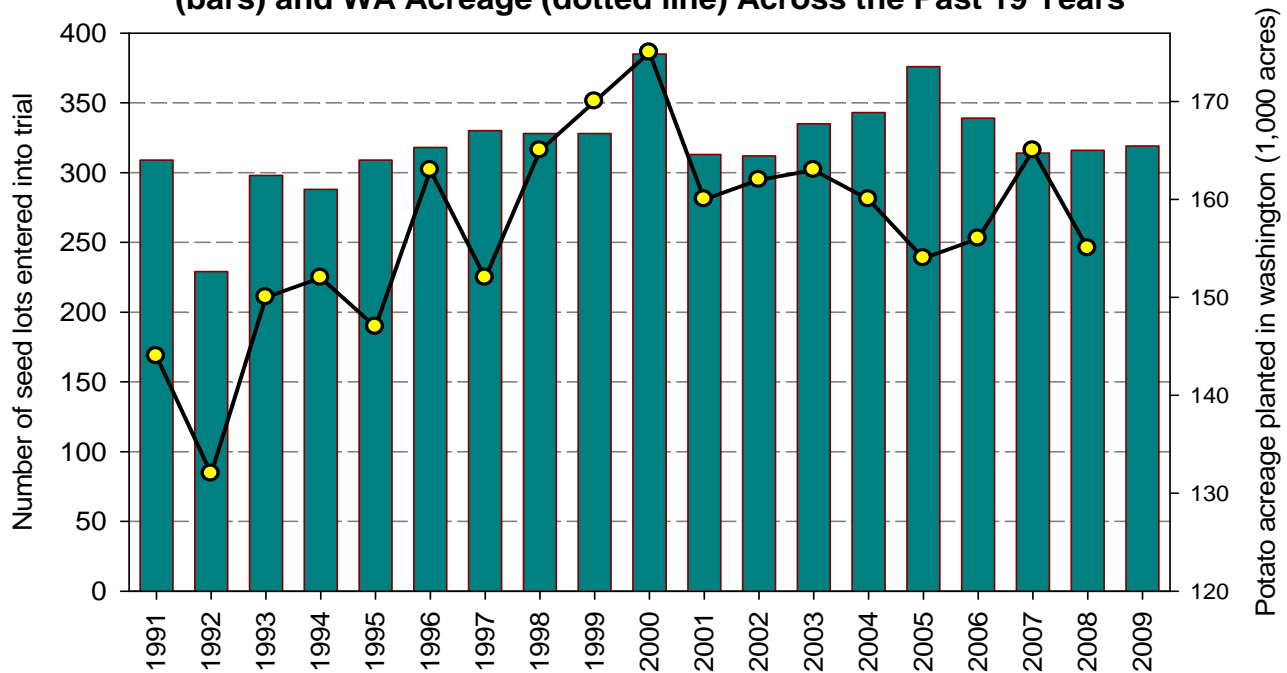


2009 Washington State Commercial Seed Lot Profile and Potato Field Day Preview

Mark J. Pavek & Zach Holden
 Washington State University, Pullman, WA

Potato seed lot samples entered into the commercial seed lot trial were up slightly from the previous two years. There were 319 seed lots submitted this year, compared with 316 in 2008 and 314 in 2007 (Figure 1, bars). Potato acreage in 2008 was down from 2007 and potato acreage for 2009 has yet to be reported (Figure 1, dotted line).

Figure 1. Number of Potato Seed Lots Entered into the WSU Seed Lot Trial (bars) and WA Acreage (dotted line) Across the Past 19 Years



Canada supplied seed lots are on the increase following the 2008 reopening of the US/Canadian border to Alberta-grown seed potatoes (Figure 2). MT seed lot numbers have declined steadily over the past three years, while WA, ND, and “Other” regions have increased slightly. The interest in new varieties is on the rise and some of these other regions may be experiencing growth as growers search for and buy any and all available seed.

Russet Burbank, Ranger, and Shepody seed lots have experienced a steady decline over the past several years while samples from Premier Russet and “Other” varieties have jumped dramatically (Figure 3). Alturas, Norkotah, and Umatilla seed lot numbers remained mostly unchanged.

Varieties developed by the Northwest Potato Variety Development Program/PVMI accounted for 49% of the seed lots entered into the 2009 trial and included: Premier Russet, Classic Russet, Alpine Russet, Blazer Russet, Clearwater Russet, Highland Russet, Yukon Gem, Western Russet, Alturas, Ranger, Umatilla, and A88338-1.

Figure 2. Percent of Seed Lots from each Region between 2007-09

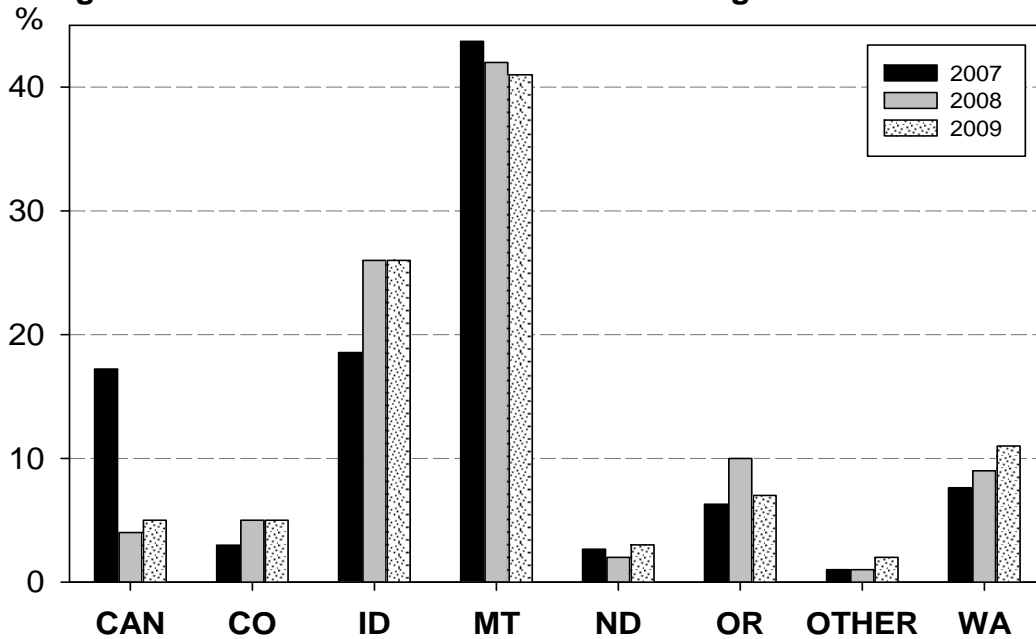
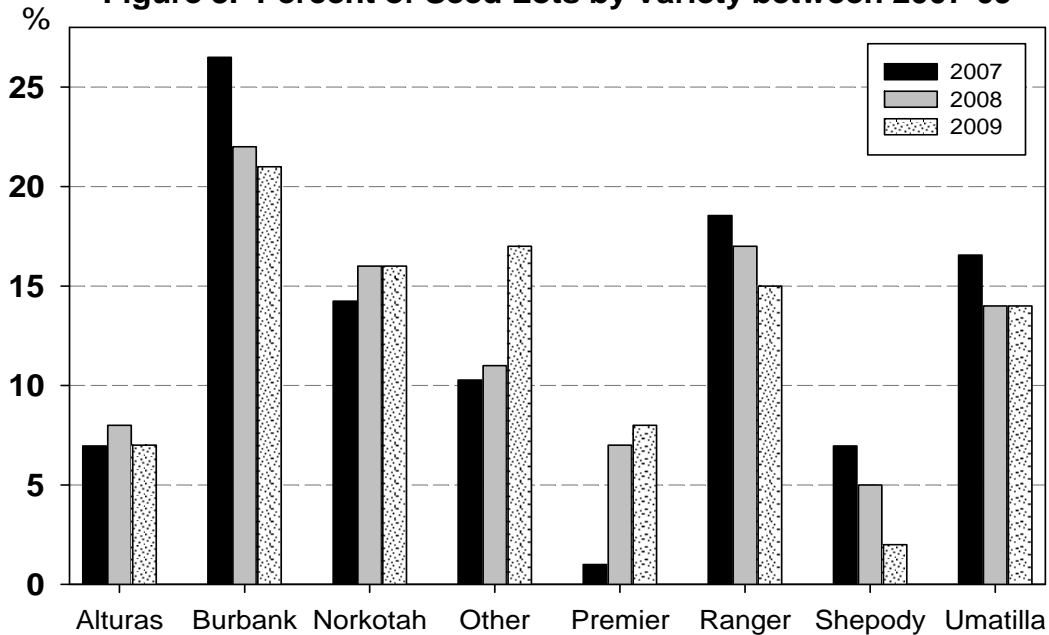


Figure 3. Percent of Seed Lots by Variety between 2007-09



The potato field day will begin at 8:30 am on Friday, June 26 at the WSU Othello Research Farm (see program below). In addition to viewing the seed lots, you will be able to participate in one of three concurrent sessions. Sessions I and II will allow you to view a sample of this year’s in-field research. Session III is an Irrigation Application Efficiency Workshop. We anticipate that all three sessions will offer CCA credits, and that Sessions II and III will offer pesticide applicator recertification credits for WA and ID. A hosted-lunch, offered between 11:30 and 1:00, will complete the field day. The agenda, seed lot information, and a map to the research center can be found on our website: www.potatoes.wsu.edu

WSU Potato Field Day – June 26, 2009

Located at WSU Othello Research Unit

(6 miles East of Hwy. 26/17 Junction, On Booker Rd, ¼ Mile South of Hwy. 26)

8:30 - 9:00 am Coffee and rolls

9:00 - 10:00 am Visit Seed Lot Trial

Concurrent Session I: Potato Cultural Practices Field Tour

- 10:15 am **Money for nothing and your chips for free**
Jeanne Debons – Potato Variety Management Institute, Bend, OR
- 10:30 am **Screening for phytonutrient-rich baby potatoes**
Roy Navarre – USDA/ARS – Prosser
- 10:45 am **Strategies for Increasing Seed Productivity – Specialty & Russet Cultivars**
Rick Knowles, Lisa Knowles, Jake Blauer – WSU, Pullman
- 11:00 am **Physiology of Mottling & Other Postharvest Disorders**
Daniel Zommick, Lisa Knowles, G.N.M. Kumar, Rick Knowles – WSU, Pullman
- 11:15 am **Screening for Low-Input Cultivars: Four In-Season N Rates Applied to Eight Potato Cultivars**
Mark Pavek, Zach Holden, Chris Hiles, Rudy Garza, Josh Rodriguez – WSU, Pullman
- 11:30 am **Alturas and Premier Russet In-Season Nitrogen Rates for Maximizing Potato Profits**
Chris Hiles, Mark Pavek, Rick Knowles, Zach Holden, Rudy Garza, Josh Rodriguez – WSU, Pullman
- 11:45 am **Effects of Management on Tuber Maturity & Processing Quality**
Rick Knowles, Mark Pavek, Chris Hiles, Lisa Knowles, Zach Holden – WSU Pullman
- 12:00 pm - 1:00 pm **HOSTED LUNCH**

Concurrent Session II: Potato Pest Management Field Tour

- 10:15 am **Money for nothing and your chips for free**
Jeanne Debons – Potato Variety Management Institute, Bend, OR
- 10:30 am **Potato Insect Pest Survey for the Columbia Basin: Aphids, Tuberworm, and Leafhoppers**
Carrie Wohleb – WSU – Grant & Adams Counties
- 10:45 am **Research aimed at managing soil borne diseases of potato**
Tom Cummings, Dennis Johnson - WSU, Pullman
- 11:00 am **Effect of infected seed on Verticillium wilt and black dot**
Dennis Johnson, Tom Cummings – WSU - Pullman
- 11:15 am **Impact of pectolytic bacteria and Verticillium dahliae on potato production.**
Brenda K. Schroder, Jeremiah Dung and Dennis Johnson – WSU - Pullman
- 11:30 am **Insect pathogen suppression of Colorado potato beetles**
Randa Jabbour, Bill Snyder - WSU, Pullman
- 11:45 am - 1:00 pm **HOSTED LUNCH**

Concurrent Session III: Irrigation Application Efficiency Workshop

- 10:15 am **Uniformity and Application Efficiency of Irrigation Systems. Obscure but Significant Costs**
Troy Peters, WSU – Prosser, Leigh Nelson, USDA-NRCS, Tom Hoffmann, WSDA – Moses Lake

The workshop will introduce the concept of distribution uniformity, the causes of poor irrigation system performance, and economic and ecological ramifications of poor distribution uniformity.

Topics to be discussed: measures of irrigation efficiency; distribution uniformity: What is it, why is it important, and how it is measured; factors that affect distribution uniformity; process of determining distribution uniformity; corrective measures to improve distribution uniformity; effect of poor distribution uniformity on operational costs; measuring water flow rate of an irrigation system using an ultrasonic flow meter; demonstration of flow rate and distribution pattern of properly and malfunctioning sprayheads and pressure regulators; effect of poor distribution uniformity on environmental degradation; evaluate irrigation system integrity for chemigation applications; conducting site assessments to determine field suitability for chemigation; and common problems with chemigation

- 12:15 - 1:00 pm **HOSTED LUNCH**
CCA and pesticide recertification credits have been applied for (WA & ID)

Wanted: Lilliston Potato Cultivator

WSU Potato Group (Pavek/Knowles) interested in buying, or accepting as a donation, a 2-row Lilliston Potato Cultivator, 3 pt. Please Contact Mark Pavek at mjpavek@wsu.edu or 509-335-6861.

Caterpillars (a.k.a. 'worms') on Potatoes

This year the potato commission is funding the second year of a research project on the identification, biology, and pest status of the suite of caterpillars that feed on potato foliage (excluding tuberworm). Some background information follows:

1. Potential caterpillar pests in potato fields include the bertha armyworm, western yellowstriped armyworm, spotted cutworm, variegated cutworm, red backed cutworm, *Lacanobia subjuncta*, alfalfa looper, and cabbage looper.
2. These moths all are highly mobile, and can arrive in potato fields following flights of miles to hundreds of miles.
3. Regional populations vary significantly from year to year. Also, species have varied phenologies, with adult flight, egg laying, and feeding by larvae occurring at different times of the potato-growing season.
4. Larvae of these species vary in their ability to develop on potato. Some do extremely well on potato, while others fare poorly.
5. Most people, including most entomologists, have difficulty separating the different species, whether worms or adult moths. This is further confounded by the fact that over 850 species of moths in this group occur in the state, and about 250 are present in the irrigated areas of central Washington.

We are asking for your help!

As a part of this project, we want to find many infestations of foliage-feeding caterpillars in potatoes. Each outbreak will be studied in the field, and samples will be collected and studied in the laboratory. **If you detect a caterpillar outbreak, please contact Andy Jensen at 509-760-4859 or Alan Schreiber at 509-266-4348.**

Potato Insect Pest Survey for the Columbia Basin of Washington Aphids, Tuberworm, and Leafhoppers

Washington State University Extension and the Washington State Potato Commission have joined efforts to conduct a regional potato insect pest monitoring program that targets green peach aphid, potato tuberworm, and beet leafhopper. Fields across the Columbia Basin are monitored weekly, and the results are communicated to potato growers via a phone-in hotline (888-673-6273) and a website:

<http://potatoes.wsu.edu/survey/PotatoInsectSurvey.html>. These insect monitoring efforts present a regional snapshot of insect populations, and are not meant to replace insect monitoring activities by growers and fieldmen in individual fields.