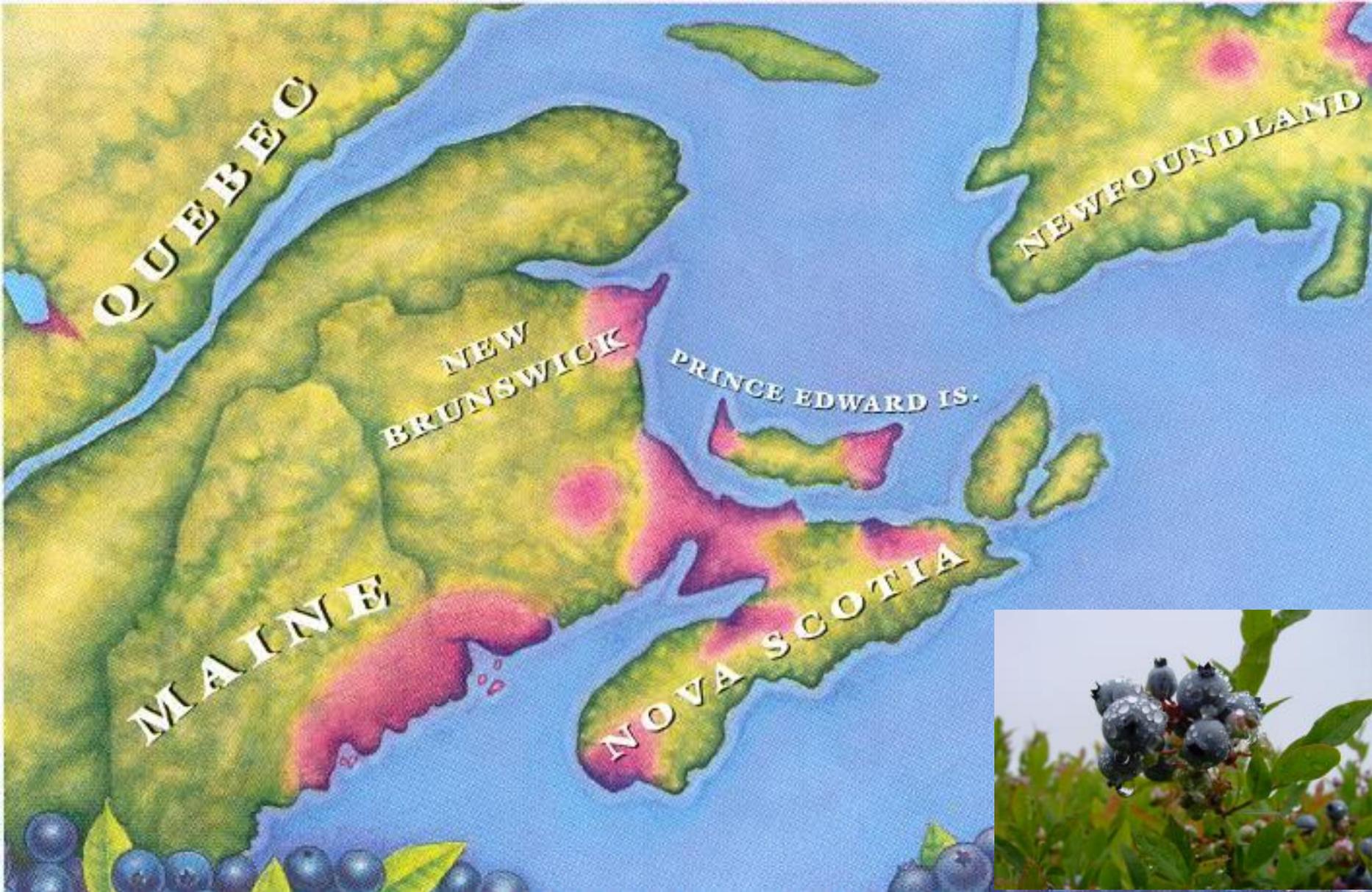


# L'effet des changements climatiques sur le bleuet sauvage



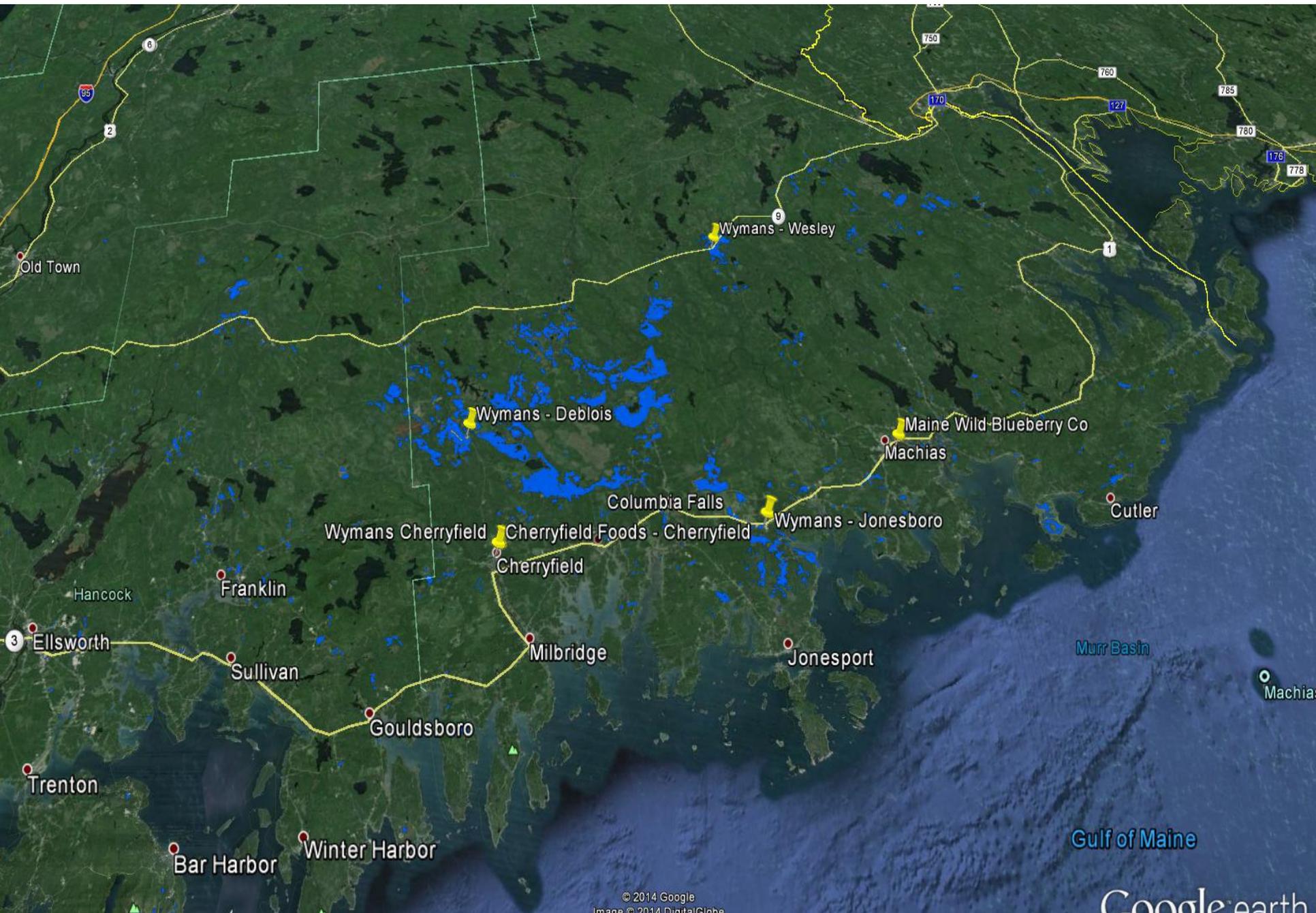
David Yarborough Frank Drummond

**Bleuet 2017 Dolbeau-Mistassini 15 Mars 2017**



**Wild production concentrated in Maine, Atlantic Canada and Quebec**

# Maine has 44,000 Acres



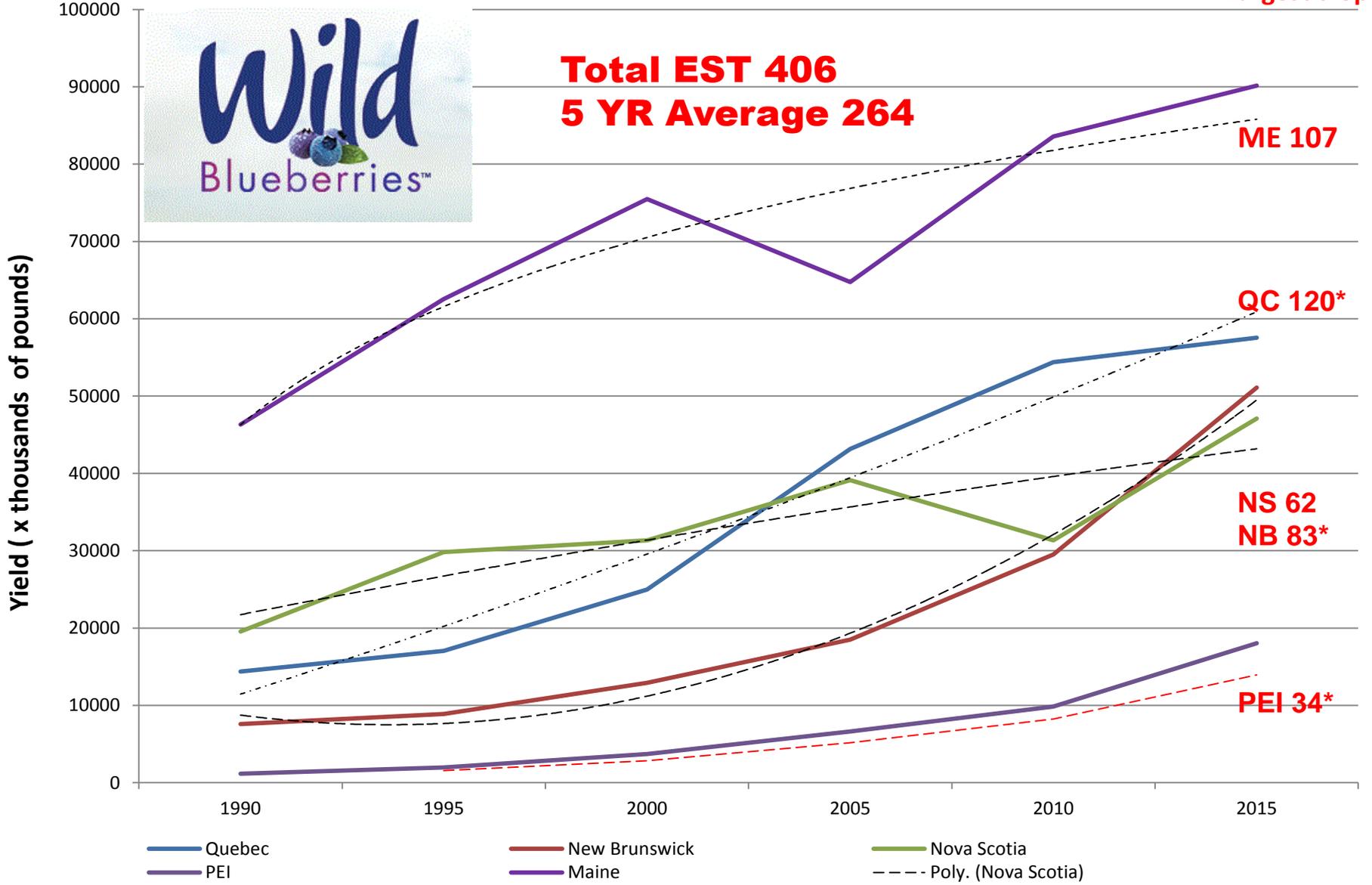
# Quebec has 84,000 Acres



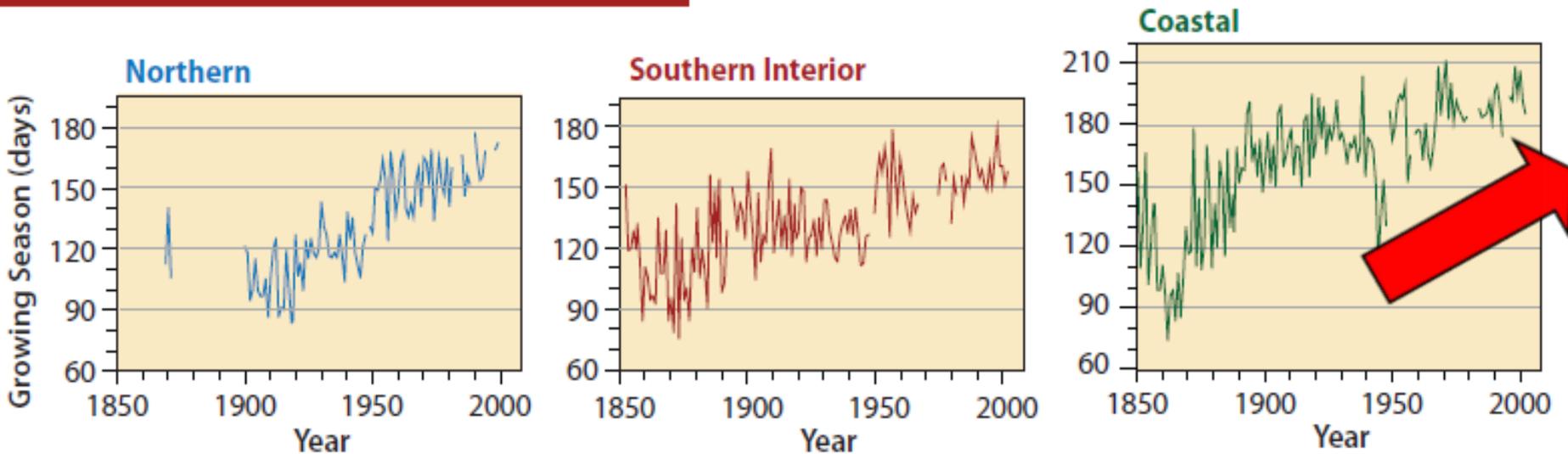
Image Landsat / Copernicus

Google

# Five-year wild blueberry yields for Maine and the Canadian Provinces **2016 EST** \* Largest crop



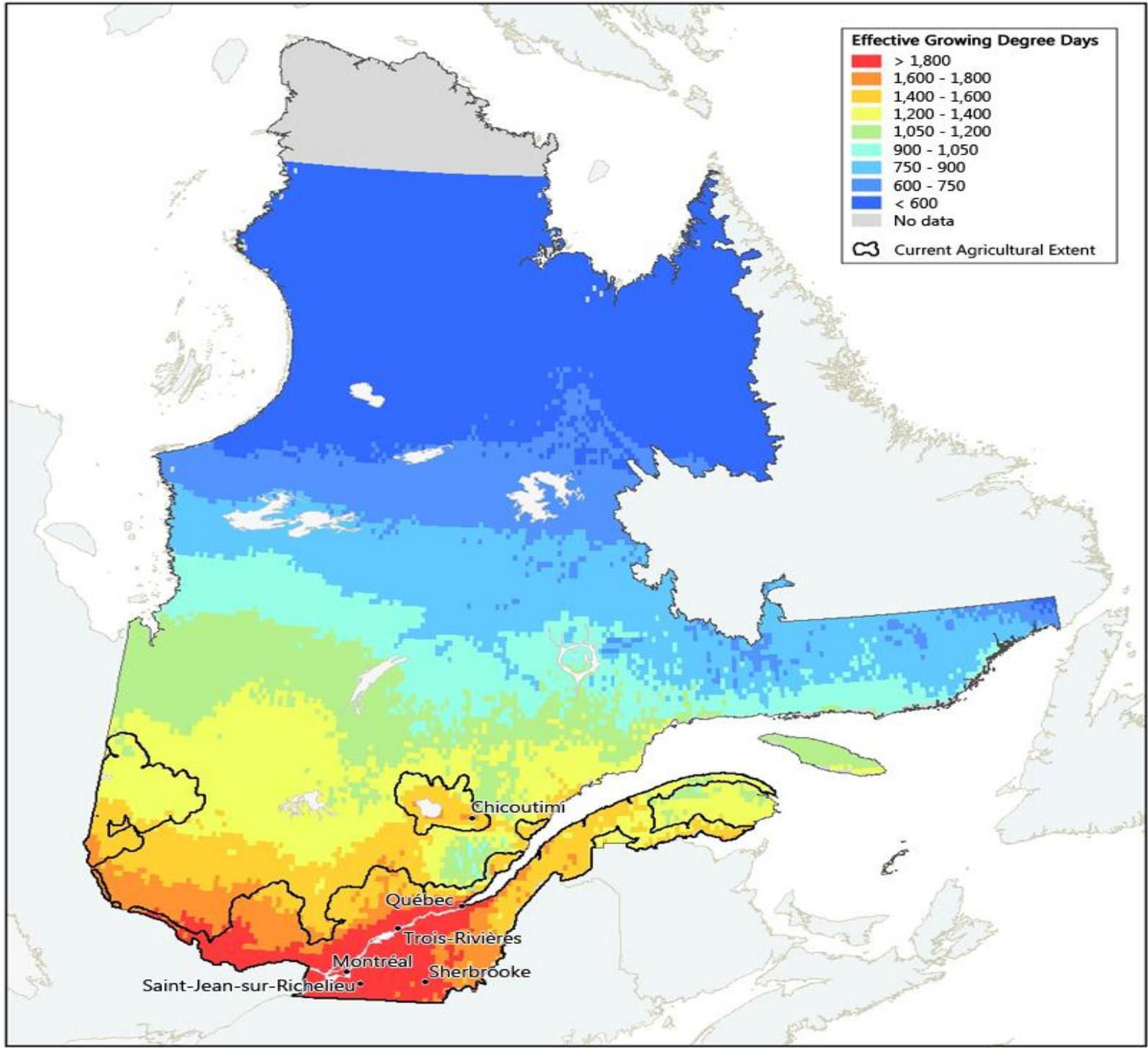
## Growing Season Length, 1850-2000



**Figure 1** Growing season length in days for each climate division in Maine, based on data from Baron and Smith (1996) and NEISA (2005). Growing seasons were at times much shorter than present, with later frosts in the spring and earlier frosts in the fall.

**From Maine's Climate future (2009)**

**The coastal region of Maine where most wild blueberries are grown has had an increase in the growing season of 30 days over the last 50 years**



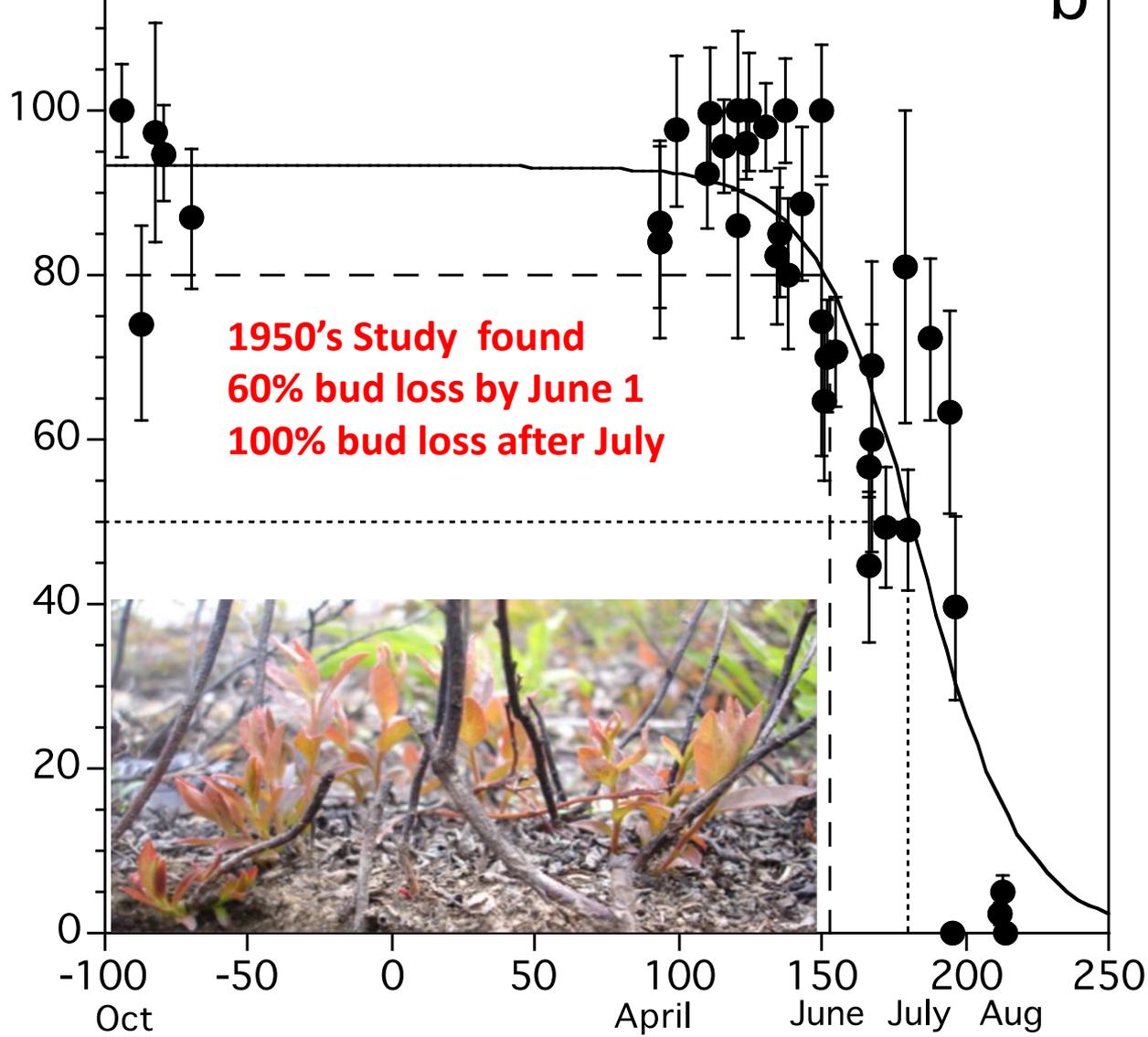
**78% of variation explained by pruning date**

**Early-June : 80% production (-20%)**

**Mid-July : 50% production (-50%)**

**b**

percent of maximum bud production



# Thrips and tip midge infest growing tips of blueberry early in season



Thrips are Increasing

Tip midge is a new pest in Maine



# *Valdensinia* leaf spot a new disease in MAINE





But defoliation is very destructive and no berries are produced on infected plants  
Prune field of wild blueberry with *Valdensinia* leaf spot, Township 25, ME

# Leaf Spot and Leaf Rust also increasing



**Both leaf spot and rust cause leaf loss and reduce production**



# Growing Season Effects on Wild Blueberry

---

## Conclusion

The 30 days of longer growing season in Maine as compared to when the studies were last done over 50 years ago will allow plants to be pruned later with less yield loss

Encourage growers to scout fields and spot prune plant with thrips and tipworm in early June and to burn *Valdensinia* in early July



# Increase in Fall Flowering



**These fall flowers will not produce fruit and so reduce production**

# Winter kill and Spring Frosts



**Open winters without snow and early bloom and frosts reduce production**

# See increase reduction in yield with warm fall followed by cold winter



**We do not see any obvious sign of injury**

See increase reduction in yield with warm fall followed by cold winter

---

**2013 Yield 8,000 lb/a**

**2015 Yield 1,500 lb/a**



# See new spring injury seen in 2016

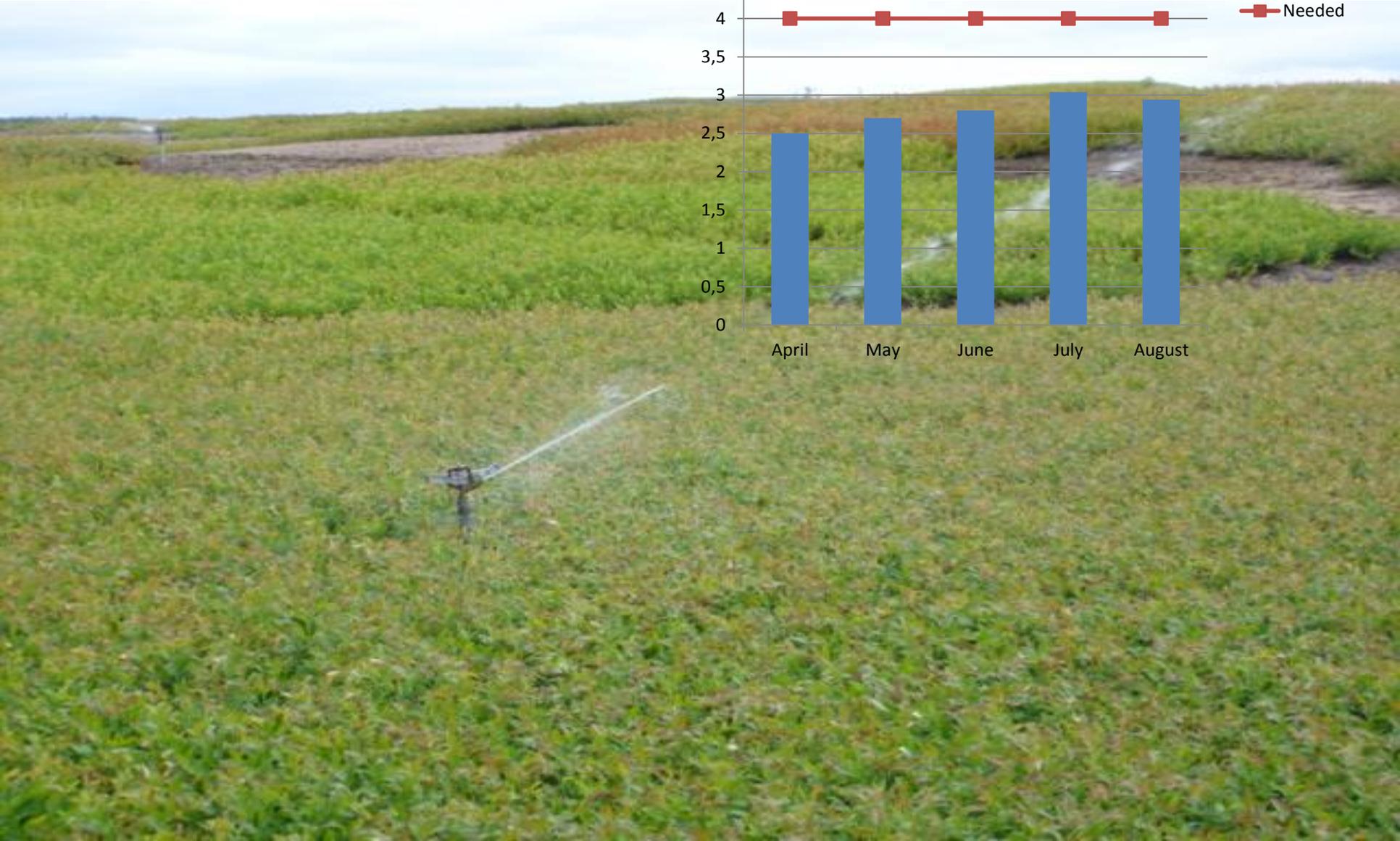
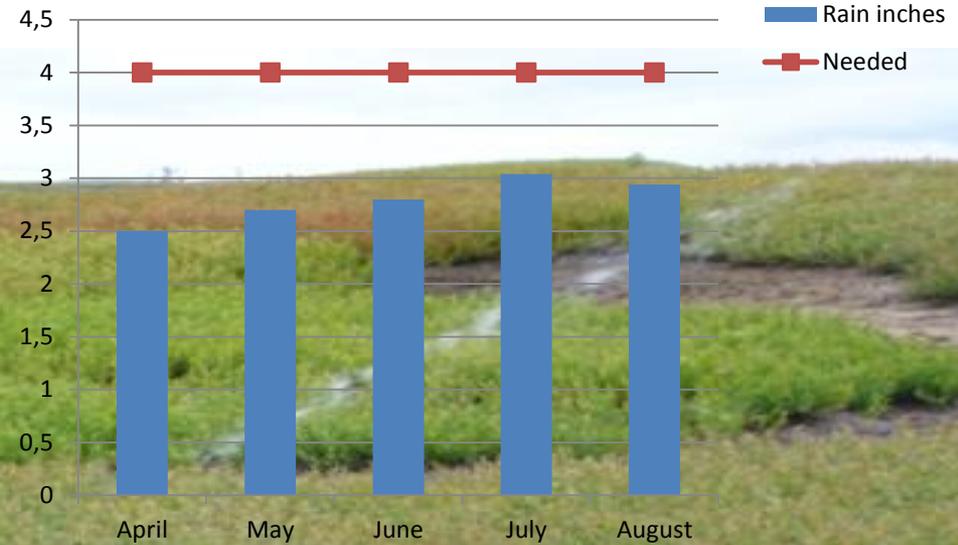
## Spring injury and decrease in yield with warm winter and cold spring temperatures

We did observe a new injury in some fields plants from warm then cold temperatures which resulted in injury to low spots in many fields





# Uneven precipitation requires irrigation



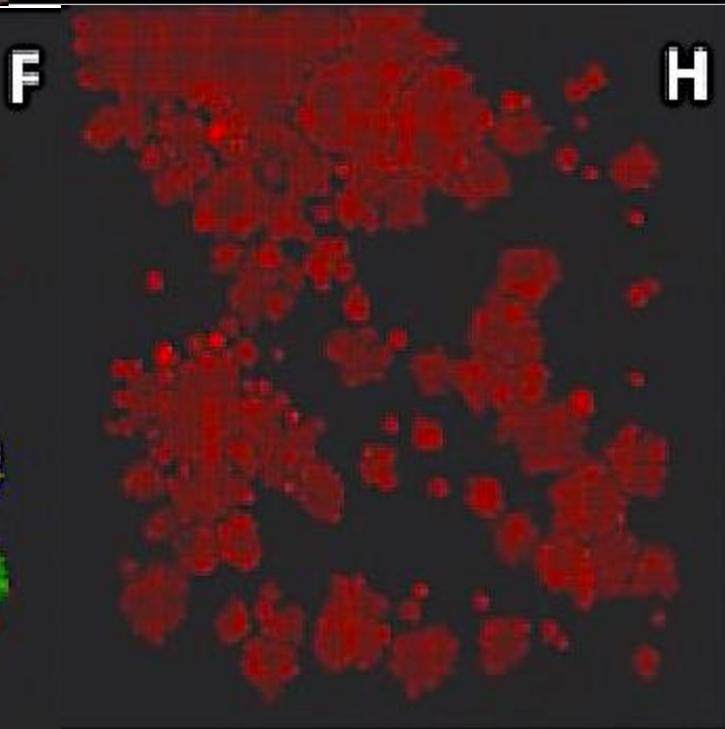
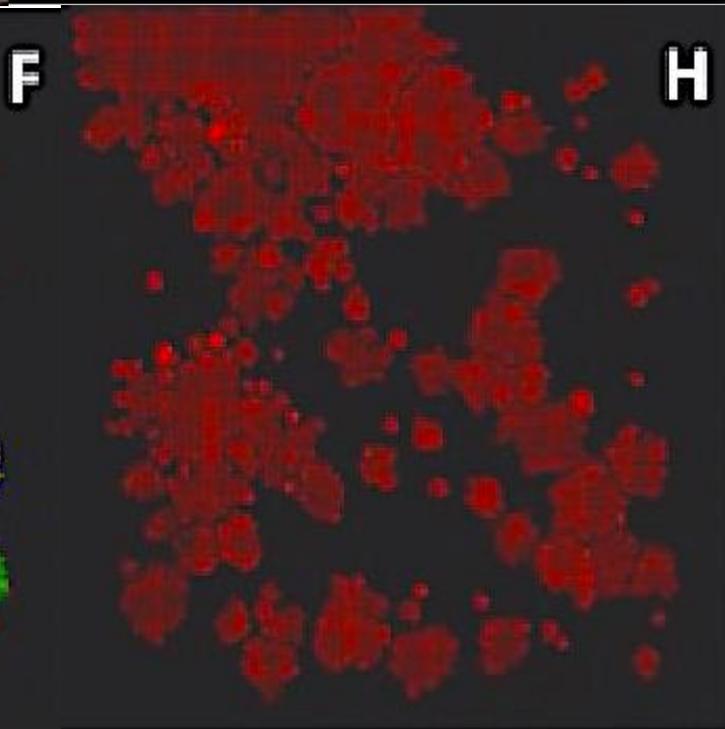
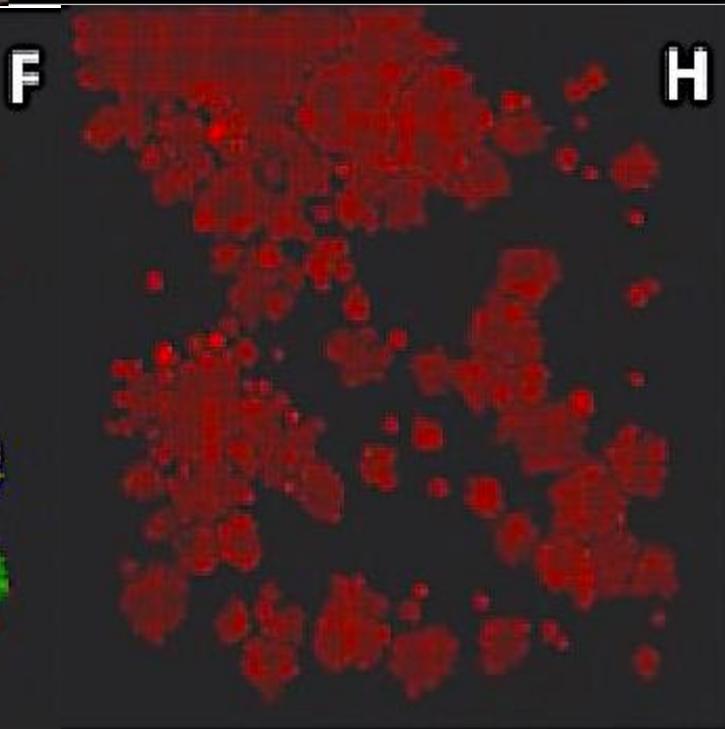
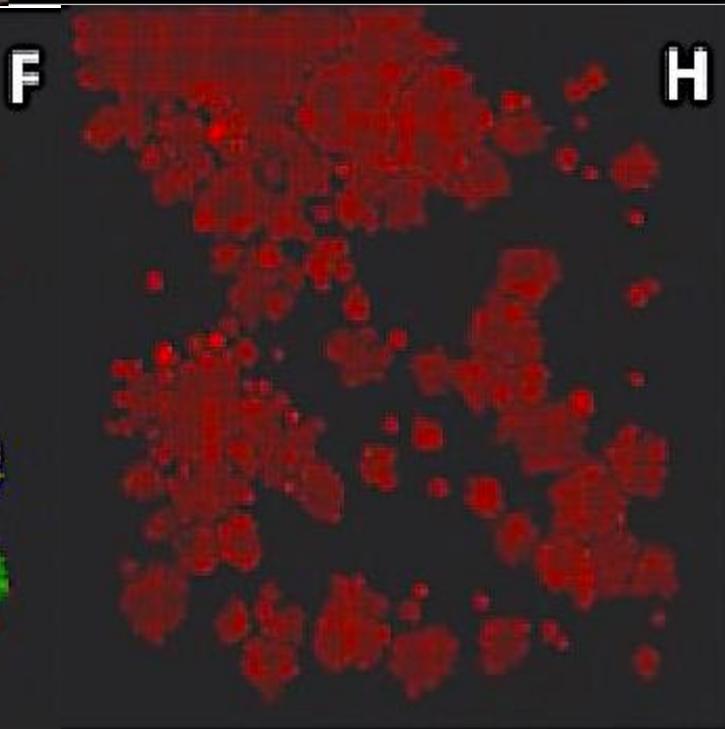
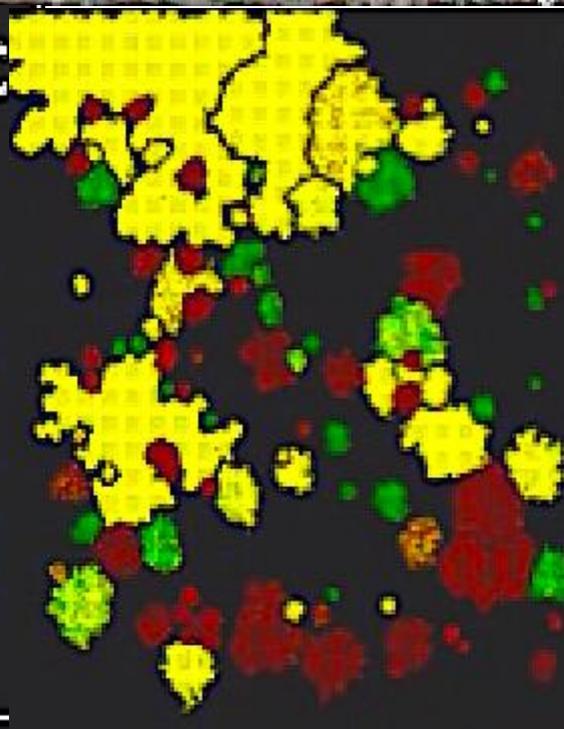
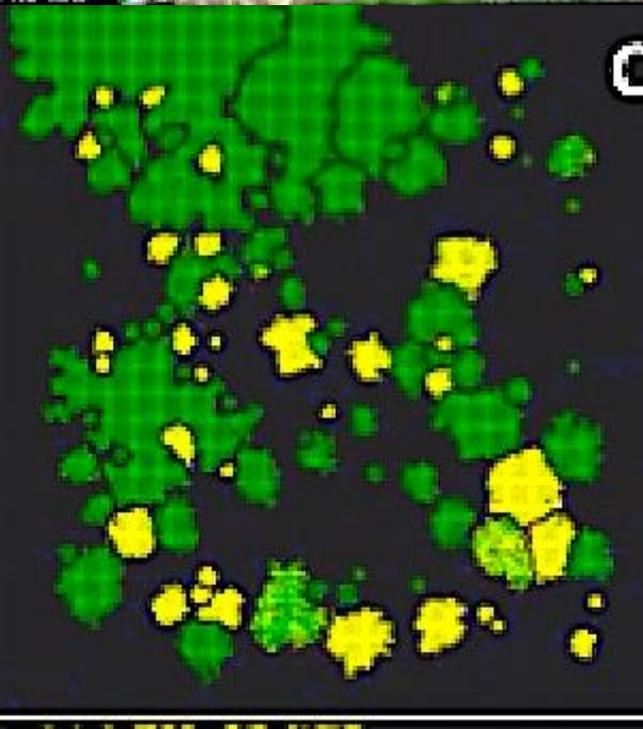
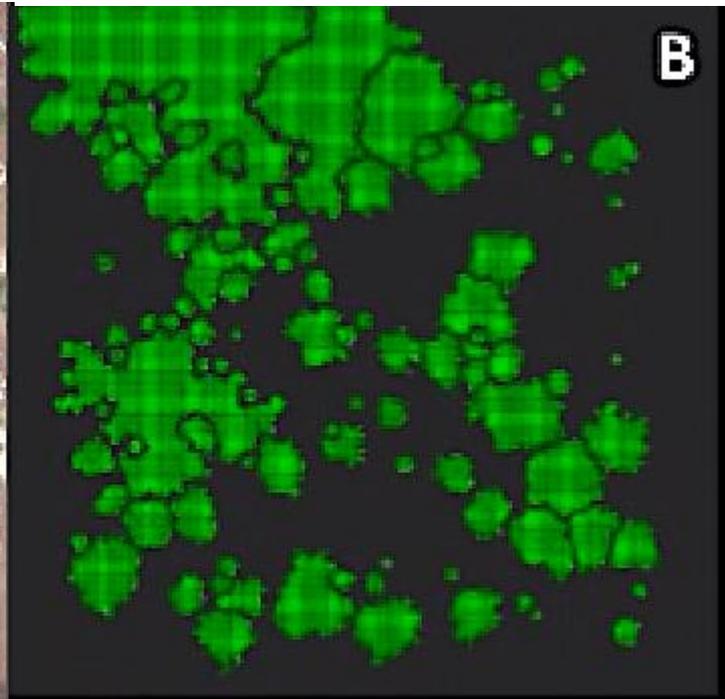
# Climate Change and Blueberry Production Research

---

Drs. Frank Drummond Seanna Annis and Hongchun Qu  
UMaine and Chongqing University

**Develop computer simulation model to test if:**

- 1.** occurrence of **wetter springs** during bloom will result in:
  - a. lower fruit set and the need for greater densities of honey bees due to less flight activity
  - b. greater incidence of mummy berry disease AND a need to spray fungicide at more frequent intervals
- 2.** occurrence of **warmer springs** during bloom will result in:
  - a. **higher activity** of honey bees and digger bees and **less activity** of bumble bees during bloom AND **shorter bloom periods**...thus we predict **similar or higher** levels of fruit set in fields that import honey bees, but **less fruit set** in fields that are entirely pollinated by native bees, especially bumble bees.
- 3.** occurrence of **hotter summers and milder winters** will result in:
  - a. **earlier and higher rates** of increase and damage rates in fruit due to the spotted wing drosophila



# Climate Change Effects on Wild Blueberry

---



- + Longer growing season provides more growth and yield
- + Longer growing season allows later pruning for pest control
- Longer growing season prevent plants from acclimating so get injury reduction in yield the following year
- Fall flowering reduces production for next year
- Uneven precipitation requires investment in irrigation to insure production
- Increase insects and cost to monitor and control
- Increase disease and cost to monitor and control
- **Net effect is to increase costs and uncertainty of production**
- **Quebec with continental climate will have lower production and more variation**



[www.Wildblueberries.com](http://www.Wildblueberries.com)

[www.Wildblueberries.maine.edu](http://www.Wildblueberries.maine.edu)