



# Potato Progress

Research and Extension for Washington's Potato Industry

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## Late Blight Test Results for A90586-11 Continue to Look Good

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The new potato clone, A90586-11, continues to be of interest to potato growers and breeders alike. It has greater foliar resistance to late blight compared to other processing potatoes, and its yield and specific gravity are as good or better than Russet Burbank. Drawbacks include tuber greening and vulnerability to blackspot bruise. A recent article in the Nov 25 edition of the *Spokesman Review*, titled "Fungus-resistant potato may save farmers a bundle," focused on this upcoming release from the Tri-State Potato Variety Development Program (see *Potato Progress I, No. 10*).

For five years we have evaluated A90586-11 for late blight resistance in field tests at WSU-Mount Vernon (Figs. 1 & 2) and other locations. No fungicides have been used in these tests. Area under disease progress curve values, which reflect the development of a disease over time (the higher the value, the more severe the disease), indicate that foliar disease in A90586-11 is about one-half of Russet Burbank each year. Incidence of blighted tubers in the field at harvest varies, and is sometimes higher for A90586-11 than Russet Burbank. However, laboratory tests in Pullman indicate lower susceptibility of A90586-11 to *Phytophthora infestans* compared to Russet Burbank once the tubers are placed in storage.

The field trials at Mount Vernon are important because they test A90586-11 against naturally-occurring late blight epidemics, and isolates of the US-8 and US-11 genotypes of *P. infestans* representing complex races. We must use a broad range of the races of a pathogen when screening germplasm for durable resistance. In this way, we select germplasm with multiple resistance genes. Such general resistance, as opposed to specific resistance, is more desirable because it is believed to be durable or long-lasting. Although not absolute, it can limit infection and reproduction of a pathogen on its host. For example, leaf lesions might still develop, but are smaller, enlarge slower and produce fewer spores than lesions on a susceptible host. We currently do not know the resistance mechanisms in A90586-11.

One possible outcome of developing new cultivars with improved resistance to late blight is an increased reliance on integrated late blight management programs. Growers may need to accept some low level of disease and be willing to employ other management tactics. In 2001, three foliar fungicide spray programs (conventional, stretched-intervals, and organic) were compared using A90586-11 and Russet Burbank at Mount Vernon. Weather conditions did not favor disease until the end of the season, and late blight was not detected at any significant level in the plots until 23 Aug.

Possibly due to the low disease pressure, there was no significant interaction between cultivar and spray program. The A90586-11 clone had significantly lower foliar and tuber disease, and higher yield than Russet Burbank as noted in several other studies. The stretched-intervals and conventional spray programs had similar AUDPC and yield values that were significantly better compared to the organic program. There was no significant difference among spray programs in weight of blighted tubers at harvest. This experiment will be repeated at Mount Vernon during 2002.

**Table 1. Results of 2001 field test at WSU-Mount Vernon using three foliar fungicide programs to control late blight on A90586-11 versus Russet Burbank.**

| Treatment and product/a                          | % Emergence | AUDPC <sup>2</sup> | Total yield (cwt/a) <sup>3</sup> | Tuber disease (% by wt.) |
|--|-------------|--------------------|----------------------------------|--------------------------|
| <b>Foliar fungicide program</b>                  |             |                    |                                  |                          |
| Conventional with mancozeb 2 lb . . . . .        | 99          | 113 a <sup>4</sup> | 620 a                            | 0.50                     |
| Stretched-intervals with mancozeb 2 lb . . . . . | 99          | 85 a               | 615 a                            | 0.54                     |
| Organic with copper hydroxide 3 lb . . . . .     | 97          | 170 b              | 587 b                            | 0.65                     |
| <i>LSD (P=0.05)<sup>5</sup></i>                  | <i>NSD</i>  | <i>45.2</i>        | <i>19.5</i>                      | <i>NSD</i>               |
| <b>Potato cultivar or line</b>                   |             |                    |                                  |                          |
| Russet Burbank . . . . .                         | 98          | 178 b              | 581 b                            | 1.0 b                    |
| A90586-11 . . . . .                              | 99          | 68 a               | 634 a                            | 0.1 a                    |
| <i>LSD (P=0.05)<sup>5</sup></i>                  | <i>NSD</i>  | <i>36.9</i>        | <i>15.9</i>                      | <i>0.2</i>               |

<sup>1</sup>Plots were planted on May 21. Applications of mancozeb were made on 6/25, 7/1, 7/16 and 7/30, or 6/25, 7/1, 7/16 and 8/6 for the conventional or stretched- intervals spray programs, respectively. Applications of copper hydroxide were made on 6/25, 7/1, 7/16, 7/30 for the organic spray program. All fungicides were applied in 50 gpa water at 30 psi using a spray boom with flat fan nozzles (8003 tips).

<sup>2</sup>Area under disease progress curve values. <sup>3</sup>Plots were harvested Sep 25. <sup>4</sup>Numbers within a column followed by the same letter are not significantly different as determined by least significant difference (LSD) test. <sup>5</sup>P value is for analysis of variance.

**See Page 3 for Figures 1 and 2.**

## Potato Progress on the Web

For those of you interested in looking back at past *Potato Progress* articles that are referred to from time to time, you can find all issues of the newsletter on the potato commission's web site, <http://www.potatoes.com>. From the home page, click on **Research**, then click on **Potato Progress**. The issues are listed in order from newest to oldest. Clicking on the article titles will open each article as a web page.

### Late blight evaluations\* at WSU-Mount Vernon, 1996-2001

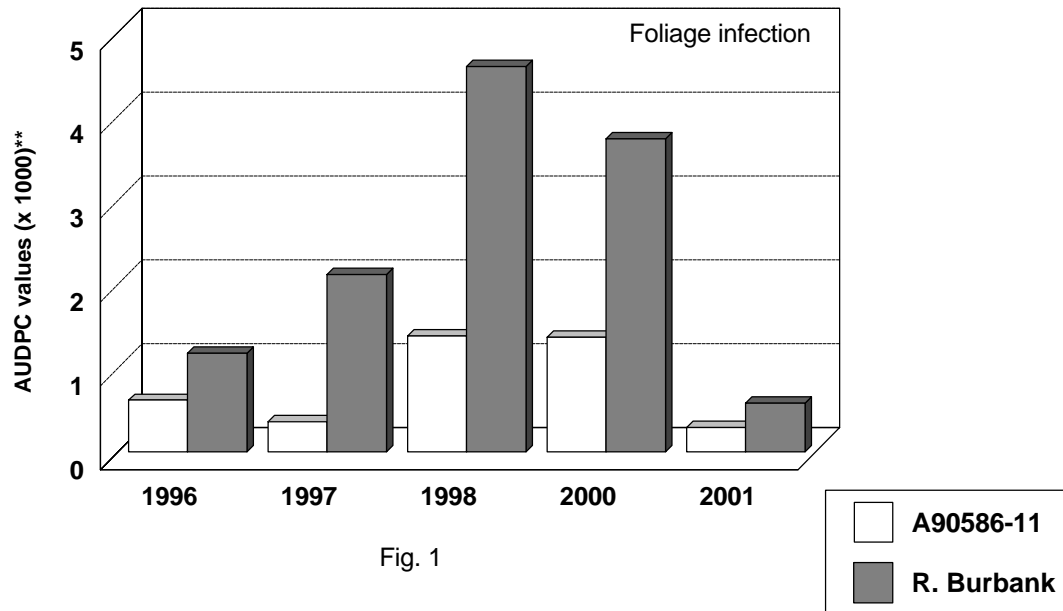


Fig. 1

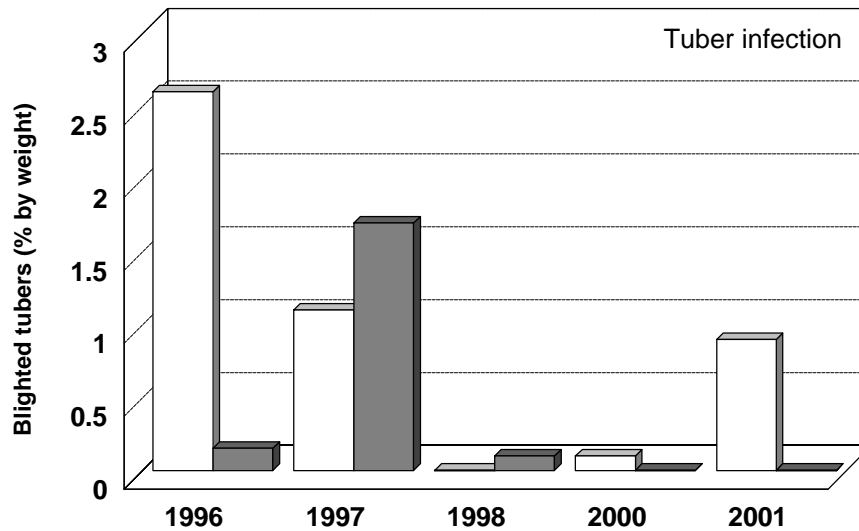


Fig. 2

\*No fungicides used

\*\*The higher the AUDPC value, the more severe the disease over the span of the growing season.

# Help Set the Research Direction for Potatoes in Washington

We at the WSPC are often asked what are our top research priorities. We have historically tried to address this question with periodic meetings of fieldmen/consultants and growers called “problems forums.” These meetings have been somewhat successful, but gather input from only a small subset of the industry. This page of *Potato Progress* is a fax-back form for any grower, consultant, or other knowledgeable party to express their opinion regarding the most pressing needs for research. If you have any interest in the research projects the commission funds, please fill out the form below and fax back to: 509-765-4853 or postal mail it to: Andrew Jensen, Washington State Potato Commission, 108 Interlake Rd., Moses Lake, WA 98837.

**Please write in your SINGLE biggest concern or interest in one or more of the following areas.**

Pest Management (think about insects, diseases, nematodes): \_\_\_\_\_

\_\_\_\_\_

Soil fertility, soil health, cover crops, crop rotations, etc.: \_\_\_\_\_

\_\_\_\_\_

Crop management (planting, harvesting, handling, irrigation, etc.): \_\_\_\_\_

\_\_\_\_\_

Post-harvest (including disease & sprout control and storage management): \_\_\_\_\_

\_\_\_\_\_

Other ideas or directions important to you (e.g. new varieties, equipment innovations, new potato products, or anything else):

\_\_\_\_\_

\_\_\_\_\_

**Please check the box that best describes your role in the potato industry.**

G Potato grower/packer

G Fieldman/Consultant

G Processor

G Scientist

G Other

**Fax completed forms to: 509-765-4853.**