

## Evaluation of Fosphite as a Postharvest Disease Management Treatment For Control of Potato Diseases

### Investigators:

Dr. Nora Olsen, Ext. Potato Specialist, University of Idaho, Twin Falls

Dr. Jeff Miller, Potato Pathologist, University of Idaho, Aberdeen

Lynn Woodell, Support Scientist, University of Idaho, Kimberly

Dr. Lyndon Porter, Post-Doctoral Fellow, University of Idaho, Aberdeen

**Objective:** To evaluate the effectiveness of Fosphite against *P. erythroseptica* inoculated tubers when used as post-harvest treatments.

### Treatment List:

Oxidate™ (hydrogen peroxide/ peroxyacetic acid mixture) was used in this test as a standard since it is one of the most commonly used post-harvest disinfectant products. Fosphite was applied at varying rates in order to better determine what concentration is required for post-harvest disease control. OxyBooster™ was also included at the client's request.

The spray mixtures were applied to tubers at a rate of 0.5 ml per ton of tubers.

### Procedures:

Washed Russet Burbank tubers were inoculated by submersion in a suspension of  $3.0 \times 10^4$  zoospores of *P. erythroseptica* (cause of pink rot). Inoculated tubers (15 tubers/replication, 4 replications) were sprayed after a 1-hour time lapse with the test treatments (Table 1) at the rate of 0.5 gal spray volume per ton of tubers using a Research Track Spray Cabinet (set at 37 speed, 42 PSI and a TeeJet™ 8001EVS nozzle). All treatments stayed in solution and flowed through the nozzle producing an even product coverage on the tubers. These treatments stimulated an application with a low-pressure boom Sprayer as potatoes are being loaded into the storage. Tubers were stored for 14 days at 55F with 95% RH. Tubers were then evaluated for incidence and severity of infection. Analysis of variance (ANOVA) was performed on incidence and percent severity.



Figure 1: Untreated Control



Figure 2: Fosphite 1:20 dilution



**JH Biotech, Inc.**  
Biotechnologies for Safer Agriculture

4951 Olivas Park Drive · Ventura, California 93003 USA  
Phone: (805) 650-8933 · Fax: (805) 650-8942  
E-mail: [biotech@jhbiotech.com](mailto:biotech@jhbiotech.com) · <http://www.jhbiotech.com>

**Table 1.** Efficacy of Fosphite on pink rot incidence and severity. Means with the same letter within a column are not significantly different at  $p \leq 0.05$ .<sup>1</sup>

Treatment (rate/ton tubers)	Incidence*	Severity**
Untreated	84.7 a	62.8 a
Oxidate (1:50 dilution)	75.3 a	34.7 b
OxyBooster (1:50 dilution)	70.0 a	29.1 b
Fosphite (1:50 dilution, 1.28 fl. oz.)	72.5 a	22.9 bc
Fosphite (1:20 dilution, 3.2 fl. oz.)	15.0 b	14.2 c

<sup>1</sup> Values in the same column followed by the same letter are not significantly different.

\* Percentage of inoculated tubers developing symptoms of disease.

\*\* Average tuber area affected. Only tubers showing symptoms of disease were used for this assessment (healthy tubers not included).

### Discussion:

Incidence of pink rot was significantly lower with a post-harvest application of Fosphite at the 1:20 dilution compared to all other treatments (Table 1; see photos). An application of Fosphite at the 1:50 rate did not significantly impact the incidence of pink rot developed compared to the control. There was an error that may have contributed to this lack of efficacy. OxyBooster™ did not reduce the incidence of pink rot in this study. All products significantly reduce the severity of disease development the greatest of all treatments. No visual phytotoxicity symptoms were seen on the Fosphite treated tubers. These results are for treatments that occurred 1 hour after inoculation. A greater delay from inoculation to treatment may provide different results. OxyBooster™ in combination with Fosphite may be an interesting combination to evaluate future.



Figure 3: Oxidate 1:50 dilution



Figure 4: OxyBooster 1:50 dilution



Figure 5: Fosphite 1:50 dilution

**SYSTEMIC FOSPHITE®**

**A FUNGICIDE FOR THE CONTROL OF DOWNY MILDEW, PHYTOPHTHORA, PYTHIUM AND VARIOUS OTHER DISEASES ON AGRICULTURAL CROPS.**

<b>ACTIVE INGREDIENT:</b>	
Mono- and di-potassium salts of Phosphorous Acid .....	<b>53.0%</b>
<b>OTHER INGREDIENTS:</b> .....	<b>47.0%</b>
<b>TOTAL:</b> .....	<b>100.0%</b>