Potential for Foliar Applications of Protectant Fungicides to Increase Incidence of White Mold of Potato

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Introduction

Foliar fungicide programs on potatoes in southern Idaho are targeted to protect against early blight (*Alternaria solani*), brown leaf spot (*Alternaria alternata*), white mold (*Sclerotinia sclerotiorum*), and late blight (*Phytophthora infestans*). The first fungicide application is recommended to be applied just prior to row closure, with subsequent applications being made every 10-14 days, depending on the disease susceptibility of the cultivar being treated. Early blight and white mold are present almost every year and fungicide programs are designed primarily with those diseases in mind. Late blight is viewed as a secondary management concern due to its sporadic occurrence.

Protectant fungicides such as chlorothalonil and mancozeb are essential components of an effective fungicide program. Chlorothalonil particularly has shown relatively high efficacy against early blight and late blight in the semiarid conditions of southern Idaho. However, research has shown that chlorothalonil use can increase white mold incidence in peanuts (1,2).

Objective

The objective of this research was to evaluate the potential of the protectant fungicides chlorothalonil and mancozeb when used alone to increase white mold incidence in potatoes.

Materials and Methods

Research plots (4 rows wide, 40 feet long) were established in 2012 in a field that was in a three-year rotation of dry bean/potato/sugarbeet. Rows were 36” apart and plants were 12” apart. Treatments were replicated four times and arranged according to a RCBD.

Foliar fungicide applications were made using a small self-propelled research sprayer with a spray volume of 13 gallons per acre. The first application was made just prior to row closure and subsequent applications were made every 10 days for Western Russet trials and every 14 days for Russet Burbank trials. Four applications were made in each treatment.

Trial 1 – Western Russet	Trial 2 – Russet Burbank
1. Untreated check	1. Untreated check
2. Bravo WS, 1.5 pt	2. Bravo WS, 1.5 pt
3. Echo ZN, 1.5 pt	3. Endura, 5.5 oz + Bravo WS, 1 pt (1,2) Bravo WS, 1.5 pt (3,4)
4. Manzate, 2 lb	4. Endura, 5.5 oz + Manzate, 1.5 lb Manzate, 2 lb (3,4)
5. Luna Tranquility, 11 fl oz	5. Luna Tranquility, 11 fl oz Bravo WS, 1.5 pt

Early blight/brown leaf spot severity was visually estimated by two individuals as the percentage of foliage affected near the end of the season. White mold incidence was determined by counting the number of lesions in the center two rows of each plot near the end of the season.

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A copy of this poster can be downloaded by scanning the QR code to the right:

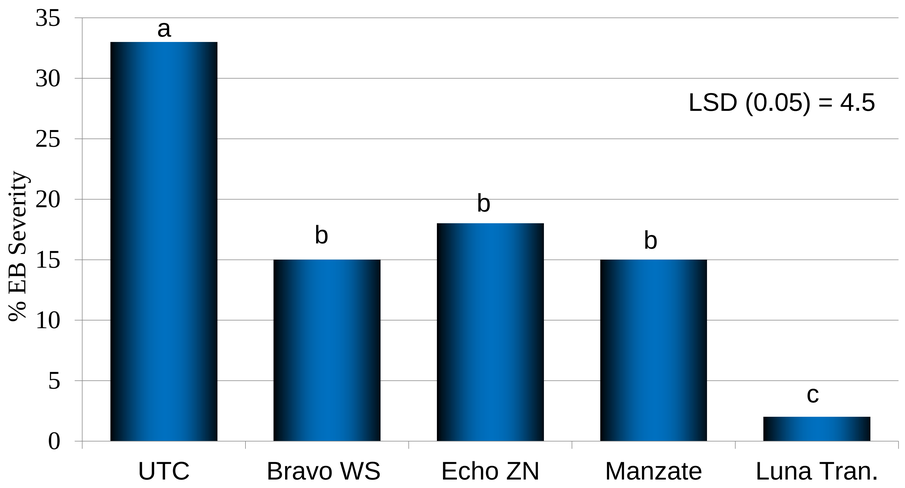

Figure 1. Effect of fungicide on early blight severity in trial 1 (cv. Western Russet; Acequia, ID; 2012). Four applications on a 10-day interval.

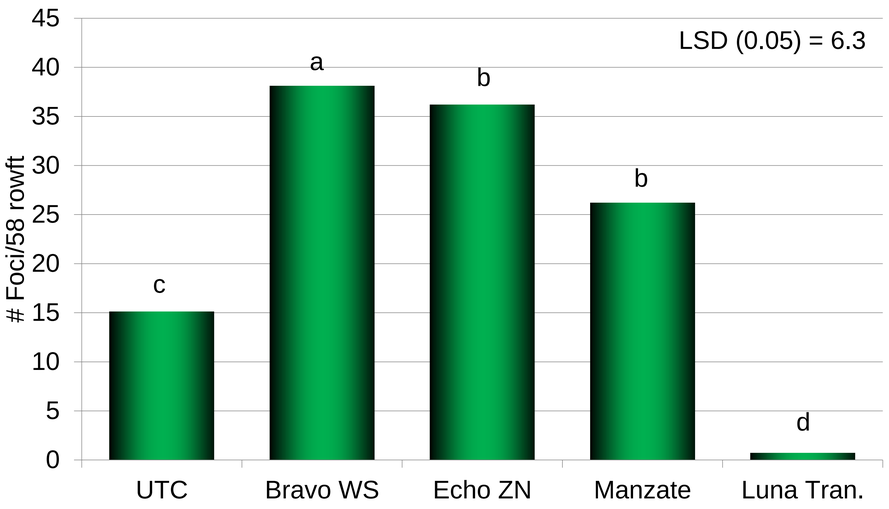

Figure 2. Effect of fungicides on white mold incidence in trial 1 (cv. Western Russet; Acequia, ID; 2012). Four applications on a 10-day interval.

Table 1. Effect of fungicide treatments on total yield in trial 2 (cv. Russet Burbank; Acequia, ID; 2012). Four applications on a 14-day interval.

Treatment	Yield (cwt/acre)
Untreated control	541 c
Bravo 4X	556 bc
Endura+Bravo 2X, Bravo 2X	561 abc
Endura+Manzate 2X, Manzate 2X	578 ab
Luna Tranquility 2X, Bravo 2X	588 a
LSD (0.05)	38.1
LSD (0.10)	28.7

Literature Cited

1. Beute, MK, Porter, DM, and Hadley, BA. 1975. Sclerotinia blight of peanut in North Carolina and Virginia and its chemical control. Plant Dis. Rep. 59:697-701.
2. Porter, DM. 1980. Increased severity of Sclerotinia blight in peanuts treated with captafol and chlorothalonil. Plant Dis. 64:394-395.
3. Partridge, DE, Sutton, TB, and Jordan, DL. 2006. Effects of environmental factors and pesticides on mycoparasitism of *Sclerotinia minor* by *Coniothyrium minitans*. Plant Dis. 90:1407-1412.

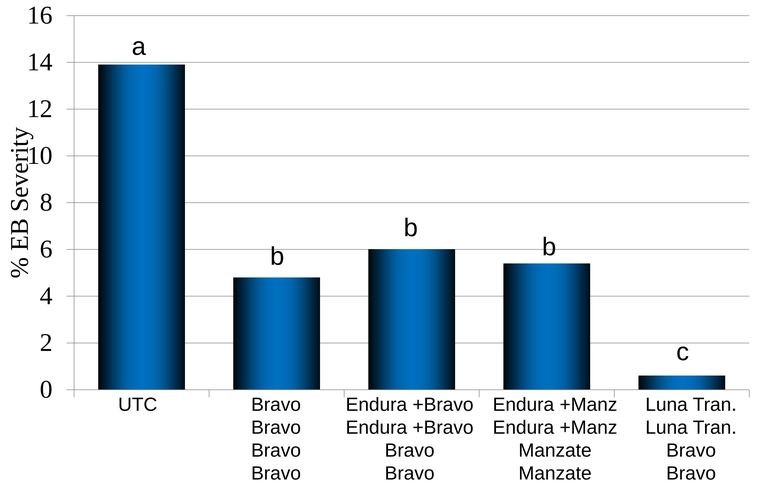

Figure 3. Effect of fungicide programs on early blight/brown leaf spot severity in trial 2 (cv. Russet Burbank; Acequia, ID; 2012). Four applications on a 14-day interval.

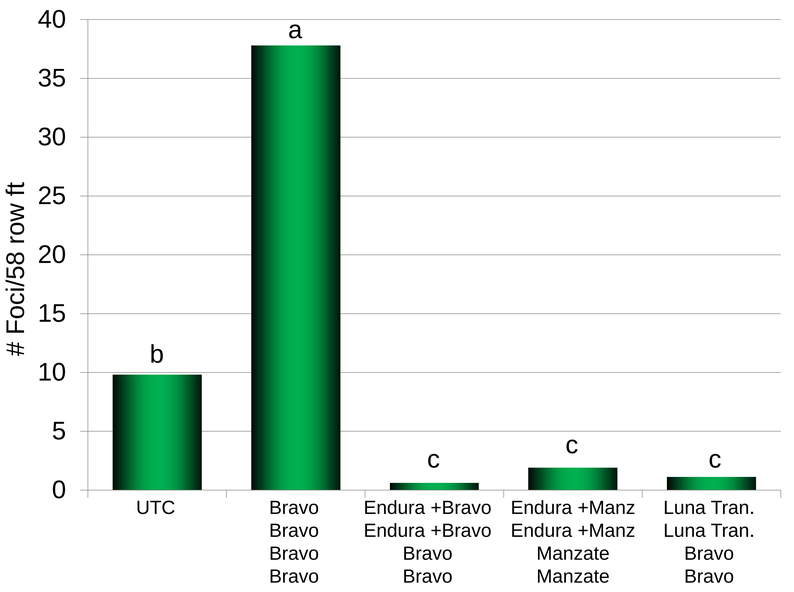

Figure 4. Effect of fungicides on white mold incidence in trial 2 (cv. Russet Burbank; Acequia, ID; 2012). Four applications on a 14-day interval.

Results and Discussion

1. Sequential applications of chlorothalonil and mancozeb significantly reduced early blight, but significantly increased white mold compared to the untreated check.
2. The boscalid + chlorothalonil (2x) followed by chlorothalonil (2x) significantly reduced both early blight and white mold.
3. Disease control with boscalid was similar regardless of the protectant (chlorothalonil or mancozeb) used in the program.
4. Fluopyram + pyrimethanil (Luna Tranquility) was highly effective in controlling both early blight and white mold.
5. Using protectant fungicides alone can increase white mold incidence compared to not using fungicides in a field setting.
6. Including a fungicide with activity against white mold in a spray program appears to negate the effect of increased disease incidence.