Fungicides Evaluated for Control of Rhizoctonia Bottom Rot of Lettuce in 1991 Field Trials

M.E. Matheron, R. Leonard and G. Major

Abstract

Bottom rot of lettuce, caused by the soil-borne fungus Rhizoctonia solani, can cause economic losses on early season lettuce harvested in November. First evidence of the disease is the appearance of brown, sunken, necrotic areas on the midribs of leaves touching the soil. Under favorable environmental conditions, the pathogen grows from leaf to leaf inside the head. If the fungus invades the leaves of the marketable head, it and all similarly infected heads are left in the field, resulting in economic losses. Field trials were established to evaluate the potential level of disease control obtainable by applying Ronilan or Rovral to lettuce beds immediately after thinning. No significant reduction in loss of marketable heads was observed in these trials, although there was a trend toward lower levels of bottom rot when either fungicide was in place.

Introduction

Bottom rot of lettuce, caused by the plant pathogenic fungus Rhizoctonia solani, can cause severe losses in the desert southwest on early season lettuce that is harvested from mid to late November. First symptoms of the disease are brown, sunken, necrotic spots on the midribs of leaves that touch the soil. As the disease progresses, the fungus grows from leaf to leaf inside the head near the base. If the disease does not progress beyond the wrapper leaves that are normally removed at harvest, no yield loss is incurred. However, if the fungus invades the leaves of the marketable head, that and all similarly infected heads are left in the field, resulting in reduced number of marketable heads. The economic loss can be severe, depending on the market price for lettuce at the time of harvest.

Materials and Methods

Three fungicide trials were established in commercial lettuce fields in Yuma County, Arizona, during the autumn of 1991. At each site, treatment plots consisted of either Ronilan or Rovral applied once at the registered rate after lettuce was thinned. The control plot consisted of no treatment with fungicides after thinning. Experimental plots were replicated five times in a randomized complete block design. Each replicate consisted of eight beds of lettuce (with two rows per bed) each at least 1,000 ft. long. Fungicides were delivered with a tractor-mounted sprayer with T-jet 8006 flat-fan nozzles that delivered 95 gal./A at 42 psi.

Since no bottom rot occurred in the Gila Valley trial, this study will not be discussed further. The other two tests were conducted at Texas Hill Farms. Plots were established in two blocks of lettuce, one seeded Sept. 3 (Emperor) and one seeded Sept. 8 (Desert Queen) on beds 42 in. between row centers. Fungicides were applied to both tests on Sept. 30. Furrow irrigation was used for the duration of the study. Disease incidence was determined Nov. 23-25 for the Desert Queen trial and Nov. 25-27 for the Emperor trial by counting the

number of cut and rejected heads in the field that had symptoms of bottom rot. Each replicate count consisted of all such lettuce heads from two adjacent beds for the length of sampled bed noted in the attached data tables. Maximum and minimum ranges of air temperature (F) for the Texas Hill site were as follows: Sep., 85-112, 59-79; Oct., 67-108, 36-69; Nov. 1-27; 68-93, 35-64. Rainfall (in inches) during the trials was as follows: Sep., 0.00; Oct., 0.80; Nov. 1-27; 0.05.

Results and Discussion

The results for the two trials at Texas Hill Farms are presented in Tables 1 & 2. Because of the variability of disease incidence among the plots, no statistical differences could be detected between the treatments. However, there was a trend toward lower levels of bottom rot in both tests when a fungicide was applied. Because of the variable nature of bottom rot incidence within a field, continued testing of fungicidal control is suggested. If the trends toward less disease suggested by this data are confirmed in future tests, then the significant benefits of treatment for bottom rot control on lettuce should become apparent.

Table 1.

Effect of Fungicides on Incidence of Bottom Rot on Harvested Lettuce Heads. Texas Hill Farms, 1991. 'Desert Queen'.

Treatment and Rate of Product/A	Number of Cut and Rejected Heads Infected with Bottom Rot
Untreated Control	246*
Rovral 4F 2 Pt/A	225
Ronilan 50DF 2 Lb/A	241

* Each treatment consisted of five replicate plots arranged in a randomized complete block design. Each value is the average number of cut and rejected heads per replicate plot infected with bottom rot on two adjacent beds each 1,113 ft. long. There was no statistical difference between these values.

Table 2.

Effect of Fungicides on Incidence of Bottom Rot on Harvested Lettuce Heads. Texas Hill Farms, 1991. 'Emperor'.

Treatment and Rate of Product/A	Number of Cut and Rejected Heads Infected with Bottom Rot
Untreated Control	162*
Rovral 4F 2 Pt/A	104
Ronilan 50DF 2 Lb/A	116

* Each treatment consisted of five replicate plots arranged in a randomized complete block design. Each value is the average number of cut and rejected heads per replicate plot infected with bottom rot on two adjacent beds each 625 ft. long. There was no statistical difference between these values.