

Reaction of Different Cultivars of Lettuce to Development of Powdery Mildew on Lettuce in 2001

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Abstract

Seven different cultivars of lettuce were seeded and watered on Dec 1, 2000 at the Yuma Valley Agricultural Center. Cultivars were rated for severity of powdery mildew caused by *Erysiphe cichoracearum* at plant maturity (Mar 21). The highest levels of powdery mildew were found on the cultivars Winterhaven and Silverado, whereas lower disease severity was observed on Jackel, Cibola, RC-74 and Accolade. All tested cultivars would have required application of fungicides to reduce the amount of powdery mildew to acceptable levels. On the other hand, planting of lettuce cultivars with some disease tolerance may require less fungicide inputs to achieve acceptable disease control compared to planting susceptible cultivars.

Introduction

Powdery mildew, caused by the fungus *Erysiphe cichoracearum*, is becoming an increasing concern for lettuce growers in the desert southwest. The disease can cause economic losses, normally on lettuce harvested in March and April, the last months of the production season. The purpose of this field study was to evaluate different cultivars of lettuce for potential resistance to this disease.

Materials and Methods

This study was conducted at the Yuma Valley Agricultural Center. The soil was a silty clay loam (7-56-37 sand-silt-clay, pH 7.2, O.M. 0.7%). Seven different cultivars of lettuce, including Accolade, Cibola, Jackel, RC-74, Silverado, Winterhaven and Wolverine, were seeded and watered December 1, 2000 on double rows 12 inches apart on beds with 40 inches between bed centers. Maximum and minimum ranges (EF) of air temperature were as follows: December (2000), 66-80, 36-53; January (2001), 59-81, 33-55; February, 59-84, 33-52; March 1 to 13, 65-76, 42-54. Maximum and minimum ranges (%) for relative humidity were as follows: December (2000), 35-97, 9-42; January (2001), 36-100, 9-59; February, 47-100, 14-76; March 1 to 13, 74-100, 18-59. Total rainfall in inches was as follows: December, 0.00; January, 0.31, February, 0.85; Mar 1-13, 0.61. Furrow irrigation was used for the duration of the trial. The severity of powdery mildew caused by *Erysiphe cichoracearum* was determined at plant maturity (March 21) by rating 20 plants randomly selected from each lettuce cultivar using the following rating system: 0 = no powdery mildew present; 1 = powdery mildew present on bottom leaves of plant; 2 = powdery mildew present on bottom leaves and lower wrapper leaves; 3 = powdery mildew present on bottom leaves and all wrapper leaves; 4 = powdery mildew present on bottom leaves, wrapper leaves and cap leaf; 5 = powdery mildew present on entire head. Yield loss due to rejected lettuce heads would normally begin to occur on plants with a rating above 2.0.

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Results and Discussion

The data table illustrates the differences among tested lettuce cultivars in susceptibility to powdery mildew that were recorded in this trial. The highest levels of powdery mildew were found on the cultivars Winterhaven and Silverado, whereas lower disease severity was observed on Jackel, Cibola, RC-74 and Accolade. All tested cultivars would have required application of fungicides to reduce the amount of powdery mildew to acceptable levels. On the other hand, planting of lettuce cultivars with some disease tolerance may require less fungicide inputs to achieve acceptable disease control compared to planting susceptible cultivars. This study will be repeated to verify the results obtained this year.

Effect of cultivar on severity of lettuce powdery mildew in 2001 field trial.

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Lettuce cultivar	Powdery mildew disease rating ^A
Jackel	2.1 a
Cibola	2.4 abc
RC-74	2.4 abc
Accolade	2.5 bc
Wolverine	2.6 c
Silverado	3.2 d
Winterhaven	4.0 e

^A Numbers followed by a different letter are significantly different ($P = 0.05$) according to the Duncan-Waller k -ratio (LSD) test.