

Evaluation of Lettuce Cultivar Susceptibility to Powdery Mildew in 2003

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Abstract

*Powdery mildew, caused by the fungus *Golovinomyces cichoracearum* (formerly known as *Erysiphe cichoracearum*), can cause economic losses in lettuce fields harvested in March and April, the last months of the production season in western Arizona. A field study was conducted to evaluate 14 different cultivars of lettuce for potential resistance to this disease. Cultivars Two Star and Big Green COS were very resistant to powdery mildew. All other tested cultivars would have required application of fungicides to reduce the amount of powdery mildew to acceptable levels. On the other hand, planting lettuce cultivars with some disease tolerance may require less fungicide inputs to achieve acceptable disease control compared to planting very susceptible cultivars. Among tested cultivars, Slugger was most susceptible to powdery mildew.*

Introduction

Powdery mildew, caused by the fungus *Golovinomyces cichoracearum* (formerly known as *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%). Fourteen cultivars of lettuce were seeded and watered December 13, 2002 in 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 2002, 53-75, 30-50; January 2003, 68-87, 37-52; February, 62-84, 31-55; March 1 to 26, 64-89, 38-58. Maximum and minimum ranges (%) for relative humidity were as follows: December 2002, 72-100, 19-66; January 2003, 60-100, 13-46; February, 67-100, 9-89; March 1 to 26, 76-100, 13-40. Total rainfall in inches was as follows: December, 0.00; January, 0.03; February, 1.15; Mar 1 to 26, 0.10. Furrow irrigation was used for the duration of the trial. The severity of powdery mildew caused by *Golovinomyces cichoracearum* was determined at plant maturity (March 26) by rating 10 plants randomly selected from each of the five replicate plots for 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.

Results and Discussion

The data table illustrates the differences in susceptibility to powdery mildew that were recorded among tested lettuce cultivars. The cultivars Two Star and Big Green COS were very resistant to powdery mildew. All other tested cultivars would have required application of fungicides to reduce the amount of disease to acceptable levels. On the other hand, planting lettuce cultivars with some disease tolerance may require less fungicide inputs to achieve acceptable disease control compared to planting very susceptible cultivars. Among tested cultivars, Slugger was most susceptible to powdery mildew.

Effect of cultivar on severity of lettuce powdery mildew in 2003 field trial.		
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Cultivar	Lettuce type	Disease rating ¹
Two Star	Greenleaf	0.0
Big Green COS	Romaine	0.4
Van Max	Head	1.2
Sniper	Head	1.3
HMX 1528	Head	1.3
Desert Spring	Head	1.3
Diamond	Head	1.4
Jackel	Head	1.8
Telluride	Head	1.9
HMX 1527	Head	2.1
Durango	Head	2.2
Sunbelt	Romaine	2.5
Silverado	Head	2.6
Slugger	Romaine	3.8
LSD (Least Significant Difference, $P = 0.05$)		0.2
¹ Numbers followed by a different letter are significantly different ($P = 0.05$) according to the Duncan-Waller k -ratio (LSD) test.		