

# Potato Leafhopper Yellowing

*Empoasca fabae* (Harris)

Thomas C. Elden

## PLANT CULTURE

### Greenhouse

Container ..... 10 cm clay pots or 55 x 32 x 6 cm flats for seedlings  
 Medium ..... Sterilized soil mixed with commercial soil mix to improve aeration and drainage  
 Temp/Light ..... 22 to 28°C; 16 hour day length  
 No. of Plants ..... 1 mature plant per pot; 30 seeds per row, 14 rows per flat, spaced 2.5 cm apart  
 No. of Reps ..... 4 minimum

### Field

Planting ..... Seed entries in drill-row plots or transplant seedlings 6 to 8 weeks of age  
 Rate ..... 1 gm seed per 3 m row or minimum of 25 seedlings per entry; space rows and plants 30 cm apart  
 No. of Reps ..... 3 minimum

## LEAFHOPPER CULTURE

Source ..... Collect adults from alfalfa fields when present; start new colony annually  
 Rearing ..... Alfalfa, broad bean, or 'Henderson' bush lima bean for mass rearing in the greenhouse  
 Temp/Light ..... 24 to 27°C, 50 to 90% RH and 15 hours minimum daylength  
 Life Cycle ..... Total time from egg laying to adult stage is about 20 days

## INVESTIGATION PROCEDURE

### Greenhouse

Plant Age ..... Seedlings: 14 to 18 days after emergence; 2<sup>nd</sup> trifoliolate stage. Mature plants: prebud stage  
 Method ..... Seedlings: plexiglass cage is placed on flat and covered with saran screen top. Mature plants: cage 2 stems per plant in a clear cylindrical plexiglass tube and seal bottom of tube with split foam plug and top with nylon netting  
 Rate ..... Seedlings: 200, 4 to 8 day old PLH adults per flat. Mature plants: 8, 4 to 8 day old PLH adults per plant  
 Length ..... Seedlings: approx. 3 to 5 days

### Field

PLH Source ..... Natural infestations of adult PLH generally occur after the first cutting  
 Plant Age ..... New seedlings or spring transplants should be kept insect free for the first year to allow establishment  
 Length ..... Plants can be scored one or more times during the second and third regrowth after the year of establishment; control of grasses in alfalfa stands has been shown to favor the development of PLH populations

## RATING OF SYMPTOMATIC INJURY

### Seedlings

Probing and feeding by PLH adults cause collapse of the petioles and subsequent death of the seedling. Because of difficulty in differentiating degrees of PLH feeding in young seedling, those seedlings that survive after 95% of all seedlings have died should be vegetatively propagated and tested as mature plants.

### Mature Plants

Most of the alfalfa germplasm which has been classified as resistant to yellowing caused by PLH feeding is fed upon by the PLH and exhibits loss of protein, stunting, reduced yields, and other symptoms. Individual plants are visually scored for percent foliar discoloration (yellowing or reddening) using a 1-5 scale.

- 1 Hi. Tolerant ..... 0 to 20% leaves yellowing
- 2 Mod. Tolerant ..... 20 to 40% leaves yellowing
- 3 Low Tolerant ..... 40 to 60% leaves yellowing
- 4 Susceptible ..... 60 to 90% leaves yellowing
- 5 Susceptible ..... Leaves necrotic and stems wilted

## CHECK CULTIVARS

	Approximate Expected Tolerance	Acceptable Range
<b>Tolerant</b>		
MSA-CW3AN3	70	60-80
<b>Susceptible</b>		
Ranger	5	0-10

Values are based on percent plant foliage yellowed and correspond to ratings of 1-2 for MSA-CW3AN3 and 4-5 for Ranger

## DISTRIBUTION AND SEVERITY OF POTATO LEAFHOPPER



Potato leafhopper, *Empoasca fabae* (Harris)

Click on the map above for a larger version. See also the [KEY](#).

### SCIENTISTS WITH EXPERTISE

Name ..... Franklin L. Bedard  
Address..... W&L Research, Inc.  
601 Oswell St.  
Bakersfield, CA 93307  
Phone..... 805-366-5525

Name ..... Thomas C. Elden  
Address..... USDA-ARS  
Bldg. 467, BARC-East  
Beltsville, MD 20705  
Phone..... 301 -504-8392

Name ..... Arthur A. Hower, Jr.  
Address..... Entomology Department  
Pennsylvania State Univ.  
University Park, PA 16802  
Phone..... 814-863-2982

Name ..... Robert A. Byers  
Address..... USDA-ARS  
U. S. Regional Pasture Res. Lab.  
University Park, PA 16802  
Phone:..... 814-863-0941

### HELPFUL INFORMATION

Drought stress and certain nutrient deficiencies can cause plant symptoms which appear similar to those caused by PLH feeding. Short, decumbent alfalfa lines often escape PLH damage. Height measurements and nymphal population counts can assist in identifying resistant plants in the field. Germplasm with adequate levels of antibiosis, nonpreference or tolerance to PLH feeding damage have not been identified which would serve as a resistant source in a breeding program. Research to date has indicated that individual plant selection following more than one cycle of seedling selection may increase the level of PLH resistance. Resistance to feeding damage, oviposition, and/or insect survival and development should be considered separately in a screening program and concurrent selection for each trait would be desirable.

### REFERENCES

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