

POTATO LEAFHOPPER YELLOWING

March 1995

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; 2nd trifoliate 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: approximately 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

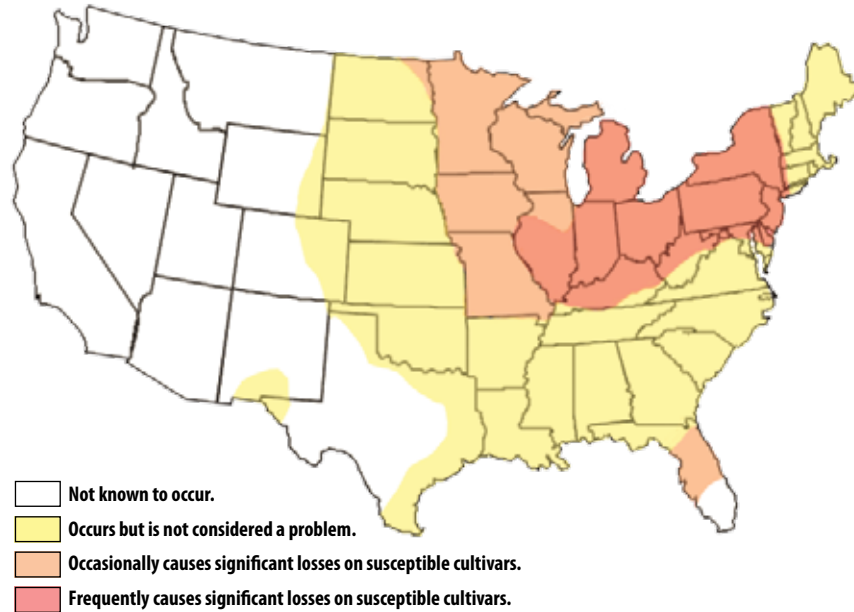
5 Susceptible Leaves necrotic and stems wilted

CHECK CULTIVARS

	Approximate Expected Tolerance (%)	Acceptable Range of Tolerance (%)
Tolerant		
MSA-CW3AN3	70	60-80
Susceptible		
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.)

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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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