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CONTRACT REPORT

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Varietal susceptibility of leeks to
damage by onion thrips



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Authentication

I declare that this work was done under my supervision according to the procedures described herein and that this report represents a true and accurate record of the results obtained.

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VARIETAL SUSCEPTIBILITY OF LEEKS TO DAMAGE BY ONION THRIPS - Thrips tabaci

SUMMARY

A single trial was undertaken to assess the level of susceptibility to thrips damage in current leek varieties.

Seventeen varieties for early harvest and 11 varieties for late harvest (maincrop) were screened for thrips damage. Two replicates of each variety were randomly arranged in the trial area with 50 plants per plot.

All the varieties were damaged by thrips but there were few significant differences in damage observed, or in thrips numbers per plant, on each variety. The variety Elina generally suffered less damage than most other varieties and the number of thrips on it were lower overall. If such a level of decreased susceptibility is maintained at higher pest densities insecticide sprays would still be necessary for control but perhaps fewer applications would be needed for effective control.



INTRODUCTION.

The onion thrips, Thrips tabaci, has a wide host range and amongst field vegetables leeks are particularly susceptible to damage. Feeding damage appears as silvery-white flecking of the leaves and in severe attacks growth may be checked and the plants distorted. The flecking of the flag reduces the value of the crop and may make the crop unsuitable for pre-packing.

Thrips problems are worse in warm dry weather when the generation time may be as short as 14 days. Several insecticide sprays may be needed to limit thrips damage under such conditions.

The objective of this trial was to assess varietal susceptibility to thrips in leeks to see if there is any potential for reducing insecticide applications by careful choice of variety.



MATERIALS AND METHODS

Site

The trial was carried out at Luddington Experimental Husbandry Farm, Stratford on Avon, Warwickshire.

Husbandry

The leeks were raised in modular trays. Early and Maincrop varieties were transplanted on the 14 May and 2 July respectively. They were planted in 1.9 metre wide beds with 5 rows and 0.1 m between plants in the row.

Design

A total of 17 early and 11 maincrop leek varieties were screened. Plots were arranged randomly with two replicates of each variety. Each plot comprised 5 rows of 10 plants each. An uncropped strip of 0.3 m was left between plots.



Treatments

The varieties screened in the trial are listed below. Some were included in both the early and maincrop assessment.

	<u>Early Varieties</u>	<u>Maincrop Varieties</u>
1	Jolant	Argenta
2	Verina	Darkal
3	Otina	Vincent
4	Tilina	Elina
5	Thor-	Jolant
6	King Richard	Bleustar
7	Javelin	Goldina
8	Greenstar	Longina
9	Albinstar	Tilina
10	Elina	Kilima
11	Goldina	Kajak
12	Pancho	
13	Kazan	
14	Longa	
15	Kilima	
16	Argenta	
17	Goliath	



Assessments

At intervals from 49-117 days after transplanting assessments were made in the field of the percentage leaf area damaged by thrips. At similar intervals plants were taken into the laboratory to assess the number of thrips per plant. All assessments were carried out on three plants from each plot.

Statistical Analyses

Differences in thrips damage and thrips numbers between varieties were subject to an Analysis of variance with a Duncan's Multiple Range Test. Standard errors (SED's) are also given with their degrees of freedom (df).

RESULTS

Early Planting

The percentage leaf area damaged by thrips and the number of thrips per plant both increased on the early planted leeks as the season progressed (Tables 1 and 2). Damage rose from 1% in early July to an average of 8% by mid-September. At this later assessment damage ranged from 5-12% according to variety but there were only two significant difference - Pancho and Tilina were damaged less than King Richard

There was a lot of variation in thrips numbers per plant but few significant differences. Longa supported fewer thrips than Goldina or Jolant and Elina and King Richard also supported fewer thrips than Jolant. Thrips numbers and damage were not closely related.

Maincrop Planting

Damage rose to an average of 8% of leaf area affected (range from 5-12%) but no differences were significant (Table 3). Thrips numbers rose to an average of 11 per plant in mid-October with Elina supporting significantly fewer thrips than either Bleustar or Kajak. (Table 4).

Compared with the early planting thrips numbers were higher and damage occurred more quickly on the main crop planting. But on the same assessment **date**, there was more damage and more thrips on the early plantings.

Table 1 Early varieties, percentage of leaf area damaged

Variety	Number of days after planting (date)		
	49 (2/7)	68 (22/7)	117 (9/9)
Jolant	1.3	1.5	7.5 ab
Verina	0.7	2.1	7.5 ab
Otina	0.9	1.2	6.7 ab
Tilina	1.0	2.0	5.0 a
Thor	0.5	1.4	9.2 ab
King Richard	0.5	0.9	11.7 b
Javelin	0.7	1.0	6.7 ab
Greenstar	0.7	1.1	9.2 ab
Albinstar	0.6	1.3	7.5 ab
Elina	1.0	1.8	6.7 ab
Goldina	0.6	1.6	8.3 ab
Pancho	0.7	1.8	5.9 a
Kazan	1.0	1.4	8.4 ab
Longa	1.0	1.9	6.7 ab
Kilima	1.6	3.1	9.2 ab
Argenta	1.6	1.6	7.5 ab
Goliath	0.8	3.0	8.4 ab
Mean of all varieties	0.9	1.7	7.8
SED (df)			2.13 (17)
CV (%)			27.5

Means within columns sharing the same letter do not differ significantly at $P \leq 0.05$.

Table 2 Early varieties, mean number of thrips per plant

Variety	Number of days after planting (date)	
	49 (2/7)	97 (22/8)
Jolant	2.8	60.5 c
Verina	2.3	21.0 abc
Otina	5.0	34.0 abc
Tilina	5.3	22.8 abc
Thor	0	34.8 abc
King Richard	4.3	19.3 ab
Javelin	2.0	20.8 abc
Greenstar	6.3	30.8 abc
Albinstar	5.8	34.5 abc
Elina	2.0	19.3 ab
Goldina	0.5	54.3 bc
Pancho	1.3	39.0 abc
Kazan	2.3	28.5 abc
Longa	1.8	11.5 a
Kilima	1.0	20.5 abc
Argenta	2.5	29.5 abc
Goliath	6.8	30.0 abc
Mean of all varieties	3.1	31.9
SED (df)		16.35 (17)
CV (%)		54.4

Means within columns sharing the same letter do not differ significantly at $P < 0.05$

Table 3 Maincrop varieties, percentage of leaf area damaged

Varieties	Number of days after planting (date)	
	68 (9/9)	103 (14/10)
Argenta	4.4	5.0 a
Darkal	4.0	6.3 a
Vincent	4.3	10.0 a
Elina	5.5	5.0 a
Jolant	4.5	6.3 a
Bluestar	5.0	12.5 a
Goldina	4.4	8.8 a
Longina	5.0	10.0 a
Tilina	5.2	5.0 a
Kilima	3.0	5.0 a
Kajak	2.9	11.3 a
Mean of all varieties	4.4	7.7
SED (df)		3.34 (11)
CV (%)		47.2

Means within columns sharing the same letter do not differ significantly at $P \leq 0.05$

Table 4 Maincrop varieties, mean number of thrips per plant

Variety	Number of days after planting (date)	
	49 (20/8)	103 (14/10)
Argenta	5.3	7.8 ab
Darkal	2.8	11.0 ab
Vincent	9.0	10.8 ab
Elina	10.3	5.5 a
Jolant	2.8	8.3 ab
Bluestar	10.3	15.0 b
Goldina	7.8	13.5 ab
Longina	7.0	12.3 ab
Tilina	5.0	6.8 ab
Kilima	4.3	10.3 ab
Kajak	3.5	15.5 b
Mean of all varieties	6.2	10.6
SED (df)		3.78 (11)
CV (%)		36.0

Means within columns sharing the same letter do not differ significantly at $P \leq 0.05$

DISCUSSION

Thrips were not sufficiently numerous in the trial to cause distortion of the young leek plants but they did cause silvering of the leaves. All varieties suffered some damage but differences between varieties were generally small. Only Elina consistently supported fewer thrips and suffered less damage than some other varieties. This effect was consistent in both of the plantings.

A reduced susceptibility to damage may be due to several factors. Firstly the variety may be less attractive to the thrips, this would be particularly relevant where, as in the trial, a choice of variety was available. Secondly the rate of multiplication on the variety may be less, or possibly the length of the life cycle may be longer. Finally the expression of the thrips feeding damage may be less severe with some varieties. Results from the trial did not give any indication as to which of these factors was important.

The weather in the summer and autumn was generally cool and damp, these conditions being unfavourable for rapid multiplication of thrips. Despite the poor conditions thrips damage was significant and, outside the trial area, where an insecticide was applied for thrips control damage was much less.

Previous experience has shown that where warm dry conditions prevail thrips damage can only be prevented by regular treatment. Although the range in susceptibility seen in the varieties in the trial was fairly small it is possible that on the less susceptible varieties the frequency of treatment necessary to prevent damage would be much less.

CONCLUSIONS

- 1) No leek varieties were immune to onion thrips.
- 2) Up to threefold differences were observed in susceptibility to thrips damage but these were not always significant.
- 3) Thrips numbers per plant were not always related to subsequent thrips damage.
- 4) Thrips damage was similar on the early and maincrop varieties.

RECOMMENDATIONS

The trial should be repeated to establish the levels of resistance in leeks to onion thrips particularly under a higher pest pressure.

Trials should be planned to test a thrips control programme on the most resistant and susceptible varieties to evaluate the potential for reduced insecticide usage on partially resistant varieties.



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STORAGE OF DATA

The raw data will be stored at the ADAS Area Laboratory, Kings Road, Evesham, for a period of 10 years. HDC will be consulted before its' disposal.