PROCESSORS & GROWERS RESEARCH ORGANISATION

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INDEX

Determination of pea aphid thresholds in vining peas

1993

SUMMARY: Positive yield responses were obtained in two of four trials to establish aphid population thresholds for economic treatment. A two-spray application at late vegetative and green bud stages kept the crop cleaner with a corresponding yield increase. Initial infestation varied from 10 - 70%. At one site, the aphid population fell rapidly during flowering and sprays did not produce yield increases.

OBJECT: To determine the infestation threshold of pea aphid at each susceptible growth stage of vining peas and to study the effects on crop health, yield and quality.

METHODS: Four experiments were carried out in four commercial vining pea crops in 1993; Metheringham, Lincs., Holbeach St. Matthews, Lincs., Gedney Hill, Lincs. and Thorney, Cambs. Site details, spray applications and crop growth stages are shown below.

Site:	Metheringham	St. Matthews	Gedney Hill	Thorney
Variety:	Puget	Vera	Orcado	Sancho
sprays applied:				
GS	108	107	107	108
date	16.6.93	21.6.93	22.6.93	21.6.93
GS	201	201	202	201
date	24.6.93	2.7.93	2.7.93	1.7.93
GS	203	203	203	203
date	6.7.93	7.7.93	7.7.93	7.7.93
harvested	22.7.93	3.8.93	2.8.93	4.8.93

All sprays were of pirimicarb at 280 g product (Aphox)/ha in 220 l water applied with a Van der Weij plot sprayer through HC/0.59/3 nozzles.

The treatments were as follows:-

	growth stage	% shoot infestation
1. untreated	-	-
2. 1 spray	late vegetative (107)	10% +
3. 2 sprays	107 + 201 (green bud)	10% +
4. 1 spray	201	10% +
5. 1 spray	203 (open flower)	20% +

Each trial was a randomised block with four replicates. Plot size was 2 m x 5 m. Aphid infestation assessments were made prior to spraying. The plots were cut and vined using the PGRO plot viner. The yield of the produce was recorded and maturity measured by tenderometer.

RESULTS: The aphid assessments and yield data are shown below:-

Site 1 Metheringham

Treatment	% infested shoots			Yield	TR
	16/6	24/6	6/7	t/ha	
1. untreated	10.0	37.5	30.0	3.61	75
2. 107	10.0	2.5	22.5	3.95	74
3. 107 + 201	10.0	0	0	4.27	75
4. 201	10.0	17.5	2.5	3.84	75
5. 203	10.0	20.0	37.5	3.58	75
SED @ P = 0.05		12.01 (Sig)	10.98 (Sig)	0.21 (Sig)	1.2 (NSD)
CV %		110.6	92.5	7.9	2.3

Site 2 - Holbeach St. Matthews

Treatment	% infested shoots			Yield	TR
	21/6	2/7	7/7	t/ha	
1. untreated	35.0	65.0	25.0	4.23	95
2. 107	35.0	17.5	27.5	3.92	95
3. 107 + 201	35.0	10.0	7.5	4.15	96
4. 201	35.0	70.0	10.0	4.25	95
5. 203	35.0	30.0	20.0	4.17	96
SED @ P = 0.05		16.11 (Sig)	12.12 (NSD)	0.39 (NSD)	1.57 (NSD)
CV %		57.5	90.5	13.4	2.3

Site 3 - Gedney Hill

Treatment	% infested shoots			Yield	TR
	26/6	2/7	7/7	t/ha	
1. untreated	45.0	12.5	0	4.95	80
2. 107	45.0	2.5	0	6.18	85
3. 107 + 202	45.0	10.0	0	5.25	83
4. 202	45.0	37.5	2.0	5.51	83
5. 203	45.0	12.5	2.5	4.58	79
SED @ P = 0.05		7.93 (Sig)	1.94 (NSD)	0.72 (NSD)	2.84 (NSD)
CV %		64.1	384.4	19.4	4.9

Site 4 - Thorney

Treatment	% infested shoots			Yield	TR
	21/6	1/7	7/7	t/ha	
1. untreated	70.0	52.5	35.0	1.85	111
2. 108	70.0	17.5	17.5	1.86	112
3. 108 + 201	70.0	5.0	5.0	1.88	114
4. 201	70.0	70.0	25.0	2.27	109
5. 203	70.0	57.5	70.0	1.54	105
SED @ P = 0.05		14.53 (Sig)	13.21 (Sig)	0.18 (Sig)	5.63 NSD
CV %		40.5	56.2	13.5	7.2

CONCLUSIONS: The pea aphid populations fluctuated at some sites, and at Gedney Hill, the population declined suddenly from a high initial level. The yield responses to treatment were statistically significant at Metheringham and Thorney, but not at Holbeach St. Matthew and Gedney Hill. The highest yields at the two sites were obtained from the earlier applications of aphicide. At Metheringham, the late vegetative followed by the green bud application stages kept the peas free of aphids throughout the summer, and aphids were kept to very low levels following the double treatment at both Holbeach St. Matthew and Thorney.

Aphid infestation varied between sites from 10% to 70% at the late vegetative to green bud growth stages. This was relatively high in comparison with previous years work and probably accounts for the greater yield responses obtained from sprays made at these earlier growth stages. Yield responses were noted at those sites where the aphid population remained in the crop throughout the growing season. At the site where the initial high population fell quickly, no positive responses were obtained.

The work is to continue for a further year in order to provide more data to establish the population thresholds at the susceptible crop growth stages.