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Thrips species on asparagus spears; survey of spears from Waikato, Manawatu, Hawkes Bay and Canterbury

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A report prepared for
South Island Asparagus Growers Association

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1 Executive summary

The South Island Asparagus Growers Association requested a survey of thrips found on asparagus spears grown throughout New Zealand because the extent of infestation and the species involved are not well documented. This information would be useful in assisting the industry to address market access issues and establish whether there is a need to disinfest export produce or introduce control measures into cropping practices.

We examined a total of 2250 asparagus spears that were sent to us from packhouses in the Waikato, Manawatu, Hawke's Bay or Canterbury from 12 growers (3 growers from each region). Thrips were extracted from spears by bashing and/or dissecting thrips from the spears.

Amongst the 1359 thrips we extracted we identified 12 thrips species from the spears.

The majority (>95%) of the thrips were identified as onion thrips, *Thrips tabaci*. In the present study, generally only one or two specimens belonging to species other than onion thrips were extracted from spears, except for *Apterothrips apteris* (26 specimens) and *Nesothrips propinquus* (27 specimens). The present study is the first record of *Frankliniella intonsa*, *Merothrips brunneus, Thrips vulgatissimus* and *Nesothrips propinquus* on asparagus grown in New Zealand. Only one of these species, *Frankliniella intonsa,* has been previously reported on asparagus grown in Taiwan (Tong 1976).

Thrips belonging to the genus *Nesothrips* were recorded by Townsend & Watson (1984) from New Zealand asparagus spears, but they did not specify which species these thrips belonged to. The other species previously recorded in low numbers from New Zealand asparagus spears by Townsend & Watson (1984) and found in low numbers in the present study included *Aeolothrips fasciatus*, *Apterothrips apteris*, *Limothrips cerealium* (cereal thrips), *Tenothrips frici*, and *Thrips obscuratus* (New Zealand flower thrips).

We also identified two additional species recorded on the MAF PPIN database, *Anaphothrips obscurus* and *Apterygothrips collyerae.*

2 Introduction

Thrips species found in asparagus in New Zealand are not well documented. A survey of thrips found in asparagus grown throughout New Zealand would allow the asparagus industry to safeguard access to export markets by considering appropriate control measures. If thrips species found on

asparagus in New Zealand are also present in importing countries then fumigation may be unnecessary.

The most recent extensive information available on thrips species on asparagus was published 20 years ago and restricted to the Waikato (Townsend & Watson 1984). Townsend & Watson undertook a survey of thrips on asparagus spears, or on sticky traps within asparagus crops, in Waikato. They examined a total of 3784 spears by washing thrips out of the spears that had been collected directly from crops. Thrips species on asparagus have also been recorded on the MAF Plant Pest Information Network (PPIN) database; a database that holds plant pest surveillance information compiled from association records and observation records for main import/export crops. However, the PPIN database does not contain information on the numbers of thrips of a given species found on spears so we do not know how frequently it may occur on asparagus.

The purpose of this project was to extend the previous records of thrips species found on asparagus by undertaking a survey of asparagus spears harvested from Waikato, Manawatu, Hawke's Bay and Canterbury.

3 Methods

3.1 Asparagus spears

Asparagus packhouses from Waikato, Manawatu, Hawke's Bay, and Canterbury (Table 1) supplied spears from three growers within their regions over a three month period (end of October to mid-December 2007). Samples of asparagus were sent via overnight couriers to the Entomology Laboratory, Lincoln, and stored at 4°C when not being examined for thrips.

Table 1: The packhouses and regions supplying spears and number of spears examined for thrips from each grower per region.

	Number of spears per grower		
Packhouse, Region	1	2	3
Boyds Asparagus Industries, Waikato	100	200	200
Tender Tips Company, Manawatu	250	200	200
Mt Erin Fruit Services, Hawke's Bay	100	100	100
Aspara Pacific Ltd, Canterbury	200	300	300

3.2 Thrips extraction from spears

Thrips were extracted from asparagus spears within 2 days of receipt. Spears were either bashed (90 spears) or dissected (10 spears), from a sample of 100. Ten of the bashed spears that had thrips dislodged from them were also dissected to see if any more thrips were present on the spears.

- Bashed spears: thrips were dislodged from spears on to a white tray by hitting the mid point of a stem of one or two spears firmly against a rod.
- Dissected spears: the 10 intact or bashed spears were dissected under a stereo microscope by removing the bracts from the spear heads.

All thrips were mounted on to microscope slides for identification using a compound microscope under 100 to 400x magnification according to the procedure of Mound & Walker (1982, 1986) with allowances for corrections/additions in thrips species since that time.

4 Results and discussion

4.1 Processing of spears at the different packhouses

Spears provided from the Manawatu and Waikato packhouses for this current survey were collected before they entered the packhouse in order to retain the greatest number of thrips (and potentially the greatest diversity) on the spears. Spears entering the Manawatu packhouse are first washed and trimmed before being graded on appearance and size. They are then packed before being treated in hot water, and then hydrocooled. Spears delivered to the Waikato packhouse are initially washed, then hydrocooled, then graded, followed by a second hydrocooling treatment.

Spears from the Hawke's Bay and Canterbury packhouses are washed, graded, and then packed. Asparagus samples sent to the Entomology Laboratory from Hawke's Bay and Canterbury were small export quality spears in order to determine the species present on export quality spears.

4.2 Thrips species

From the 2250 bashed or dissected spears, 1359 thrips were extracted and identified. The bashing method dislodged around 90% of thrips in the spears, based on the results from dissection of 10 spears per 90 bashed spears. Of the 2030 bashed spears, 1075 thrips were extracted while a further 90 thrips were extracted by dissecting 220 bashed spears from which thrips had been dislodged. The 220 spears (10 spears per sample of 100) that were dissected resulted in a total of 194 thrips.

The majority of thrips (>95%) extracted from the spears were onion thrips, *Thrips tabaci*, and were found on spears harvested from all regions examined. Generally only one or two specimens of the other species listed in Table 2 were extracted from the asparagus spears except for *Apterothrips apteris* and *Nesothrips propinquus*, where 26 specimens of each species, were extracted from spears supplied by the Manawatu packhouse. However,

the varying number and state of the spears provided by the different packhouses precludes comparison of numbers of thrips from the different regions. The species of thrips found on asparagus spears grown in the different regions are provided in Table 2.

Table 2: The presence (+) or absence (-) of thrips species on asparagus spears grown in the different regions.

Thrips species	Waikato	Manawatu	Hawkes Bay	Canterbury
Terebrantia				
Aeolothrips fasciatus	-	+	-	-
Anaphothrips obscurus	-	-	+	-
Apterothrips apteris	-	+	-	-
Merothrips brunneus	-	-	-	+
Frankliniella intonsa	+	-	-	-
Limothrips cerealium, cereal thrips	-	-	-	+
Tenothrips frici	-	+	-	-
Thrips obscuratus, New Zealand flower thrips, female and/or male	+	-	-	-
Thrips tabaci, onion thrips	+	+	+	+
Thrips vulgatissimus	-	+	-	-
Tubilifera[1]				
Apterygothrips collyerae	-	+	-	-
Nesothrips propinquus	-	+	+	-

[1]Identification to be confirmed.

This is the first record of *Frankliniella intonsa*, *Merothrips brunneus, Thrips vulgatissimus* and *Nesothrips propinquus* on asparagus in New Zealand. All of the other species listed in Table 2 have been recorded on asparagus grown in New Zealand either by Townsend & Watson (1984) or on the PPIN database. *Frankliniella intonsa* has been recorded on asparagus elsewhere (Tong 1976), but there are no records of the other three species being found on asparagus. *Thrips vulgatissimus* is a polyphagous herbivore found in Europe, North America and Australia, in addition to New Zealand. *Merothrips brunneus* is only found in New Zealand, generally in leaf litter, and is believed to feed on fungi. *Nesothrips propinquus* generally inhabits grasslands and has been found in South Africa and Australia, in addition to New Zealand.

This study was by no means an exhaustive survey of the thrips that may occur on asparagus grown in New Zealand. In addition to those listed in the present study, Townsend & Watson (1984) found *Aptinothrips rufus, Chirothrips manicatus* (also recorded from mid Canterbury, PPIN)*, Thrips australis, Thrips nigropilosus,* and *Haplothrips niger* in low numbers on asparagus spears. Additionally the PPIN database has a record of *Hoplothrips orientalis* on asparagus spears, although there is no information regarding the frequency of occurrence of this species on spears.

5 Acknowledgements

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6 References

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