Florida Cooperative Agricultural Pest Survey
Program Report No. 2006-08-SDS-01

Florida Department of Agriculture and Consumer Services
Charles H. Bronson, Commissioner

Assessment of Chili Thrips, *Scirtothrips dorsalis* Hood, in Florida

A. J. Silagyi and W.N. Dixon

Division of Plant Industry
Florida Department of Agriculture and Consumer Services
PO Box 147100
Gainesville, FL 32614

Charles Bronson
Commissioner of Agriculture

Richard Gaskalla
Division Director

On October 2, 1991, four thrips specimens collected in a retail garden center in Okeechobee County, Florida on mixed hosts were identified as chili thrips, *Scirtothrips dorsalis* Hood, by Dr. Steve Nakahara, USDA Systematic Entomology Laboratory, in Beltsville, MD. On October 1, 1994, an additional sample collected in a retail garden center on an unknown host in neighboring Highlands County was identified as *S. dorsalis* by Dr. Nakahara. Subsequent surveys were carried out following each detection, but no *S. dorsalis* was found, suggesting that both detections were not indicative of established populations.

In 2004, the Florida Cooperative Agricultural Pest Survey (CAPS) program began a survey for *S. dorsalis* in Broward and Miami-Dade Counties in South Florida. The survey targeted primarily ethnic markets and their environs with some commercial pepper and cucurbit fields included. Specific commodity surveys of tomato (*Lycopersicum esculentum*) and pepper (*Capsicum* spp.) were also surveyed in 2004 and early 2005, but no *S. dorsalis* was found.

On October 14, 2005, following more than a decade without a single report in Florida, *S. dorsalis* was detected in Palm Beach County at a private residence on ornamental roses, *Rosa sp*. This detection, also confirmed by Dr. Nakahara, had high populations and extensive plant damage that almost assured it was not an ephemeral event. Plant inspectors with the Florida Department of Agriculture and Consumer Services/Division of Plant Industry (FDACS/DPI) subsequently discovered this polyphagous pest in numerous commercial retail garden centers throughout Florida, primarily on roses and peppers. By the end of 2005, *S. dorsalis* had been positively identified on several hosts in 15 counties in approximately 60 retail garden centers (Map 1). In early 2006, the CAPS team designed an environs survey using 5-mile radii around positive nursery detections in three counties (Lake, Orange and Seminole) where the highest number of positive detections had occurred (Table 1 and Map 1).

The objectives of the survey were to establish the extent of *S. dorsalis* populations outside the garden centers with positive detections and to identify additional host plants in Florida. The survey was conducted June 5 - 9, 2006, by FDACS/DPI and USDA/APHIS/PPQ CAPS personnel. Residential and commercial areas within the 5-mile radii were inspected visually by three teams of two individuals with each team assigned to Lake, Orange or Seminole Counties. While *S. dorsalis* is known to have a wide host range, our survey efforts focused on residential or commercial businesses with ornamental rose plantings and/or gardens containing peppers within visual range. Additional ornamental plants were surveyed if in close proximity to roses or peppers.

The survey technique consisted of observing plant tissue for signs of swiftly moving and lightly-colored thrips as well as plants showing typical thrips feeding damage. If plants were

symptomless and/or showed no sign of any thrips then no sample was taken and the property was recorded as negative (Map 2). A sample consisted of plant tissue placed in one-gallon Ziploc® plastic bags and washed with 70% isopropyl alcohol in the field. Suspect thrips specimens were maintained in the alcohol and refrigerated until screened by CAPS personnel in Gainesville the following week. CAPS personnel were trained to screen *S. dorsalis* by FDACS/DPI, University of Florida entomologists and the USDA Entomology Identifier to reduce the familiar taxonomic bottleneck often associated with mass arthropod identifications. The CAPS team effort was very productive during the three days of survey visiting 55 properties and collecting 57 samples (Table 2). Not all properties visited were sampled while some properties had more than one sample collected. The thrips screening effort eliminated 20 of the 57 samples taken. Since preparation time for thrips identification is approximately 2.5 mounted thrips per hour, over 8 hours of mounting and identification time for the specialists were avoided.

Of the 37 samples submitted for identification, 27 samples taken from 25 properties were identified positive for *S. dorsalis* (Table 3). As of September 2006, *S. dorsalis* has now been positively identified 186 times in 24 of Florida's 67 counties in a multitude of settings such as retail garden centers, residences, businesses, parks and along roadsides (Table 1).

Four new confirmed host records for *S. dorsalis* were also recorded: *Ricinus communis* (castor bean), *Rhaphiolepis umbellate* (yedda hawthorn), *Rhododendron* sp., and *Viburnum suspensum* (viburnum) and one unconfirmed host record for *Duranta erecta* (golden dewdrop) (Table 3). The unconfirmed host record status is due to lack of a botanical sample. This insect is known to be polyphagous where established and has proven no different in Florida. As of September 2006, *S. dorsalis* has been found on 46 plant species in 33 botanical families (Table 4). While 22 of the species and 19 botanical families are considered unconfirmed host records since no host material was submitted for identification to the FDACS/DPI botanist, the fact that 24 confirmed host species in 16 plant families were recorded denotes the wide range of hosts this thrips can utilize.

Survey data was collected in the field using personal digital assistants (PDA) installed with the ESRI ArcPad® software package. This mapping and data collection software combined with wireless GPS allowed survey specialists to determine in real time their exact position within the 5-mile arc relative to the thrips positive garden centers. The PDA's also allowed GPS points to be captured simultaneously as survey specialists entered field data, which assured more accurate readings with no transcribing error. USDA/APHIS pest survey specialist Joe Beckwith, in cooperation with FDACS/DPI, CAPS GIS mapping specialist

Andrea Chavez, designed the application including the Microsoft Access database used to store the data that can be used to query reports. All working and final maps were generated remotely by Dr. Nancy Leathers, USDA/APHIS cartographer.

The objective of the environs survey was to understand the full extent of *S. dorsalis* populations throughout Florida since little was known concerning its scope outside the more than 60 positive garden centers up until June 2006. Information provided by several DPI plant inspectors, supervisors and UF/IFAS faculty, together with the specific environs surveys conducted by CAPS in Central Florida, indicates that *S. dorsalis* has become well established in Florida.

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Dr. Michael Meadows	DPI CAPS Pest Survey Specialist
Brian Saunders	USDA CAPS Pest Survey Specialist
Eduardo Varona	USDA CAPS Pest Survey Specialist
Joseph Beckwith	USDA CAPS Pest Survey Specialist
Michael Patterson	USDA CAPS Pest Survey Specialist
Julieta Brambila	USDA CAPS Entomologist
Charles Whitehill	DPI Entomologist Technician
Dr. GB Edwards	DPI CAPS Entomologist
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Dr. Lance Osborne	University of Florida Entomologist
Dr. Nancy Leathers	USDA APHIS Cartographer

Table 1: All positive *Scirtothrips dorsalis* detections in Florida by county and location as of September 2006.

	Enclosed		Environs							
County	**Garden Center**	**Nursery**	**Commercial Business**	**Ditch Bank**	**Park**	**Research Center**	**Residential**	**Roadside**	**Unk**	**Total**
Alachua	3	--	--	--	--	--	--	--	--	**3**
Charlotte	6	--	2	--	--	--	--	--	--	**8**
Citrus	2	--	--	--	--	--	--	--	--	**2**
Collier	2	--	--	--	--	--	--	--	--	**2**
Dade	4	3	--	--	2	1	--	--	--	**10**
Hendry	1	--	--	--	--	--	--	--	--	**1**
Hernando	3	--	--	--	--	--	--	--	--	**3**
Highlands	2	2	--	--	--	--	--	--	1	**5**
Hillsborough	1	--	--	--	--	--	1	--	--	**2**
Lake	19	--	--	--	--	--	5	1	--	**25**
Lee	--	--	--	--	--	--	3	--	--	**3**
Levy	1	--	1	--	--	--	--	--	--	**2**
Marion	1	--	--	--	--	--	--	--	--	**1**
Martin	--	--	--	--	--	--	1	--	--	**1**
Monroe	4	--	--	--	--	--	--	--	--	**4**
Okeechobee	--	--	--	--	--	--	--	--	1	**1**
Orange	17	1	7	1	--	6	30	--	2	**64**
Palm Beach	1	3	--	--	--	--	2	--	--	**6**
Pasco	--	--	--	--	--	--	1	--	--	**1**
Pinellas	3	--	--	--	--	--	--	--	--	**3**
Polk	--	1	--	--	--	--	--	--	--	**1**
Seminole	18	1	3	--	--	--	11	1	1	**35**
St. Lucie	--	--	1	--	--	--	--	--	--	**1**
Sumter	2	--	--	--	--	--	--	--	--	**2**
24 COUNTIES	**90**	**11**	**14**	**1**	**2**	**7**	**54**	**2**	**5**	**186**

Table 2: CAPS *Scirtothrips dorsalis* environs survey by county with number of visited and positive properties.

Counties	Number of properties visited	Number of positive properties	% positive
Lake	14	5	35.7
Orange	20	11	55.0
Seminole	21	9	42.9
TOTAL	**55**	**25**	**45.5**

Table 3: CAPS environs survey positive detections for *Scirtothrips dorsalis* by county and species.

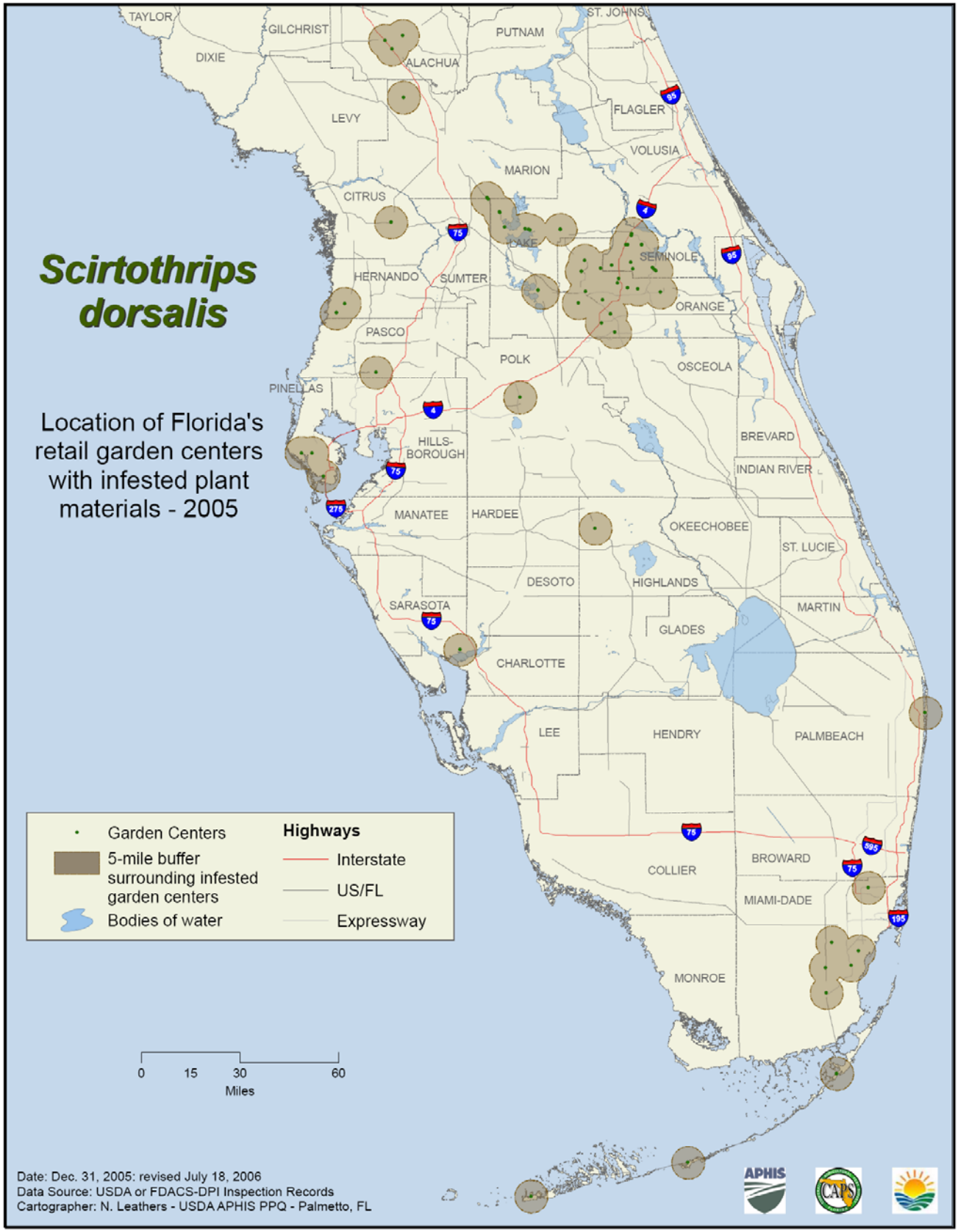
Species	Counties			TOTAL BY SPECIES
	Lake	**Orange**	**Seminole**	
Capsicum sp.	--	1	--	**1**
Duranta erecta[2]	--	--	1	**1**
Pittosporum tobira	1	--	--	**1**
Rhaphiolepsis umbellata[1]	--	1	--	**1**
Rhododendron sp.[1]	--	1	1	**2**
Ricinus communis[1]	1	1	--	**2**
Rosa sp.	3	7	8	**18**
Viburnum suspensum[1]	--	1	--	**1**
TOTAL	**5**	**12**	**10**	**27**

1=New confirmed host record
2=New unconfirmed host record; no plant sample to DPI botanist for confirmation.

Table 4: Number of FDACS/DPI confirmed and unconfirmed botanical families and their genera and species positive for *Scirtothrips dorsalis* in Florida as of September 2006.

Confirmed botanical families positive for *S. dorsalis* in Florida as of September 2006		
Plant Family	**Genus**	**species**
Acanthaceae	*Strobilanthes*	*dyerianus* Mast.
Araliaceae	*Hedera*	*helix* L.
Berberidaceae	*Mahonia*	*bealei*
Caprifoliaceae	*Viburnum*	*suspensum*
Combretaceae	*Conocarpus*	*erectus*
Combretaceae	*Laguncularia*	*racemosa* (L.) Gaertn. f.
Compositae	*Gerbera*	*jamesonii* H. Bolus ex Hook. f.
Ericaceae	*Rhododendron*	*spp.*
Euphorbiaceae	*Ricinus*	*communis*
Illiciaceae	*Illicium*	*floridanum* Ellis
Moraceae	*Ficus*	*elastica*
Oleaceae	*Jasminum*	*sambac* (L.) Ait.
Oleaceae	*Ligustrum*	*japonicum* Thunb.
Pittosporaceae	*Pittosporum*	*tobira* (Thunb.) Ait. f.
Rosaceae	*Raphiolepsis*	*indica*
Rosaceae	*Rhaphiolepis*	*umbellata* (Thunb.) Mak.
Rosaceae	*Rosa*	*sp.*
Rubiaceae	*Gardenia*	*jasminoides*
Rubiaceae	*Richardia*	*brasiliensis* Gomes
Rutaceae	*Citrus*	*sp.*
Rutaceae	*Murraya*	*paniculata* (L.) Jack
Solanaceae	*Capsicum*	*annuum* L.
Solanaceae	*Capsicum*	*frutescens* L.
Solanaceae	*Capsicum*	*sp.*
Families = 16	**Species = 24**	
Unconfirmed botanical families positive for *S. dorsalis* in Florida as of September 2006		
Amaranthaceae	*Celosia*	*argentea* L.
Araceae	*Philodendron*	*sp.*
Araliaceae	*Schefflera*	*arboricola* (Hayata) Merrill
Balsaminaceae	*Impatiens*	*walleriana* Hook. f.
Compositae	*Coreopsis*	*sp.*
Compositae	*Zinnia*	*sp.*
Euphorbiaceae	*Poinsettia*	*pulcherrima* Graham
Gentianaceae	*Eustoma*	*grandiflorum* (Raf.) Shinn.
Geraniaceae	*Pelargonium*	*x hortorum* Bailey
Hamamelidaceae	*Loropetalum*	*chinense* (R. Br.) Oliver
Labiatae	*Plectranthus*	*scutellarioides* (L.) R. Br.
Labiatae	*Salvia*	*sp.*
Leguminosae	*Phaseolus*	*vulgaris* L.
Lythraceae	*Cuphea*	*sp.*
Marantaceae	*Stromanthe*	*sanguinea* (Hook.) Sonder
Onagraceae	*Gaura*	*lindheimeri*
Rubiaceae	*Pentas*	*lanceolata* (Forssk.) Deflers
Scrophulariaceae	*Antirrhinum*	*majus* L.
Solanaceae	*Petunia*	*sp.*
Verbenaceae	*Duranta*	*erecta*
Verbenaceae	*Glandularia*	*x hybrida* (Grön. & Rüm.) Neson & Pruski
Violaceae	*Viola*	*x wittrockiana* Gams
Families = 19	**Species = 22**	

Map 1: Retail garden centers in Florida positive for *Scirtothrips dorsalis* as of December 31, 2005.



Map 2: CAPS *Scirtothrips dorsalis* environs survey results from Lake, Orange and Seminole Counties.

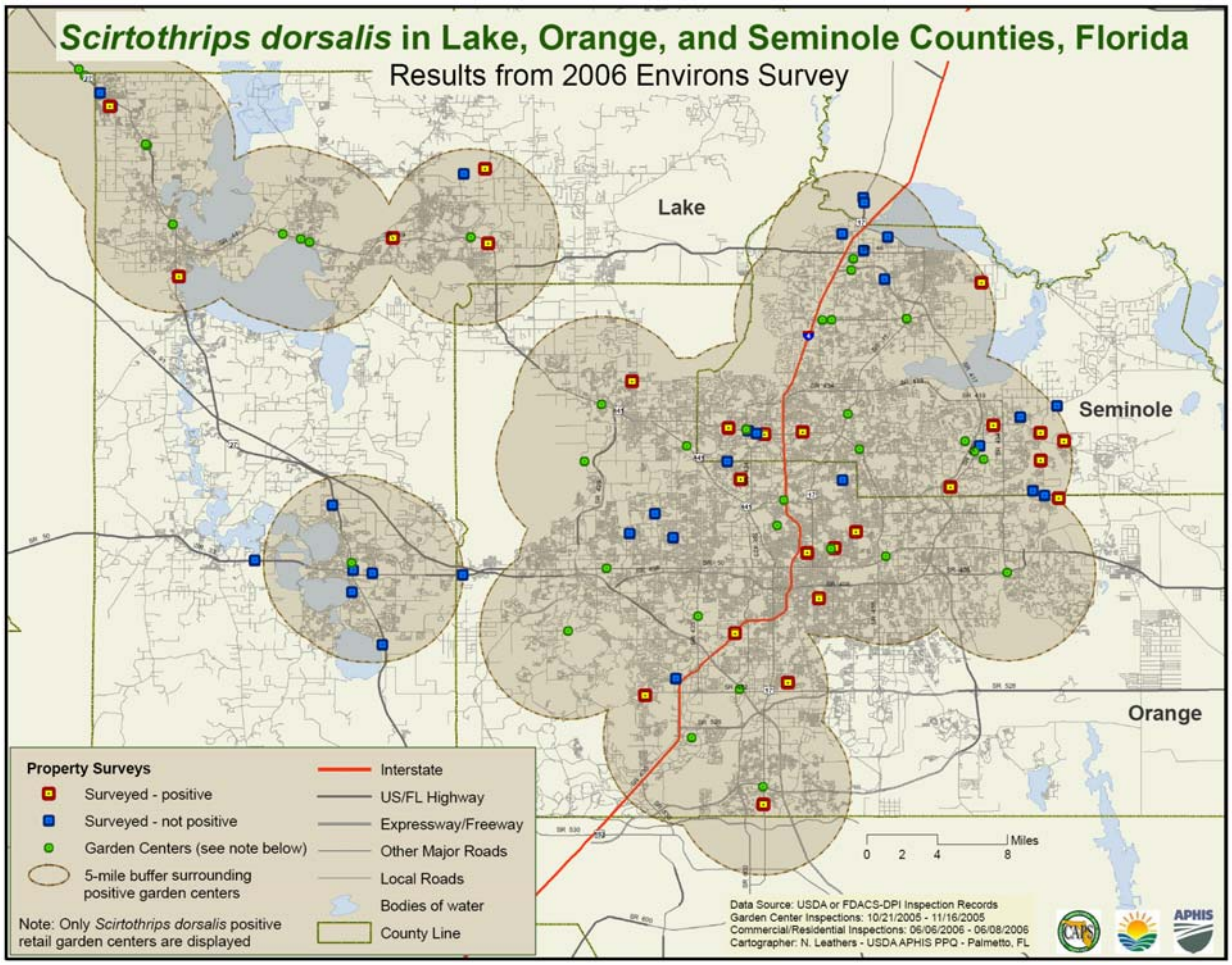


Figure 1: *Ricinus communis* positive for *Scirtothrips dorsalis* along Interstate-4 in Orange County, FL.

Figure 2: Typical damage caused by *Scirtothrips dorsalis* on *Rosa sp*., Orange County, FL.

Figure 3: *Scirtothrips dorsalis* and host material specimens ready for pre-screening.

Figure 4: FDACS/DPI and USDA/APHIS CAPS Pest Survey Specialists processing *Scirtothrips dorsalis* samples.

Figure 5: FDACS/DPI GIS Mapping Specialist washing host material for *Scirtothrips dorsalis*.

Figure 6: USDA/APHIS CAPS entomologist and FDACS/DPI CAPS State Survey Coordinator pre-screening *Scirtothrips dorsalis* specimens.