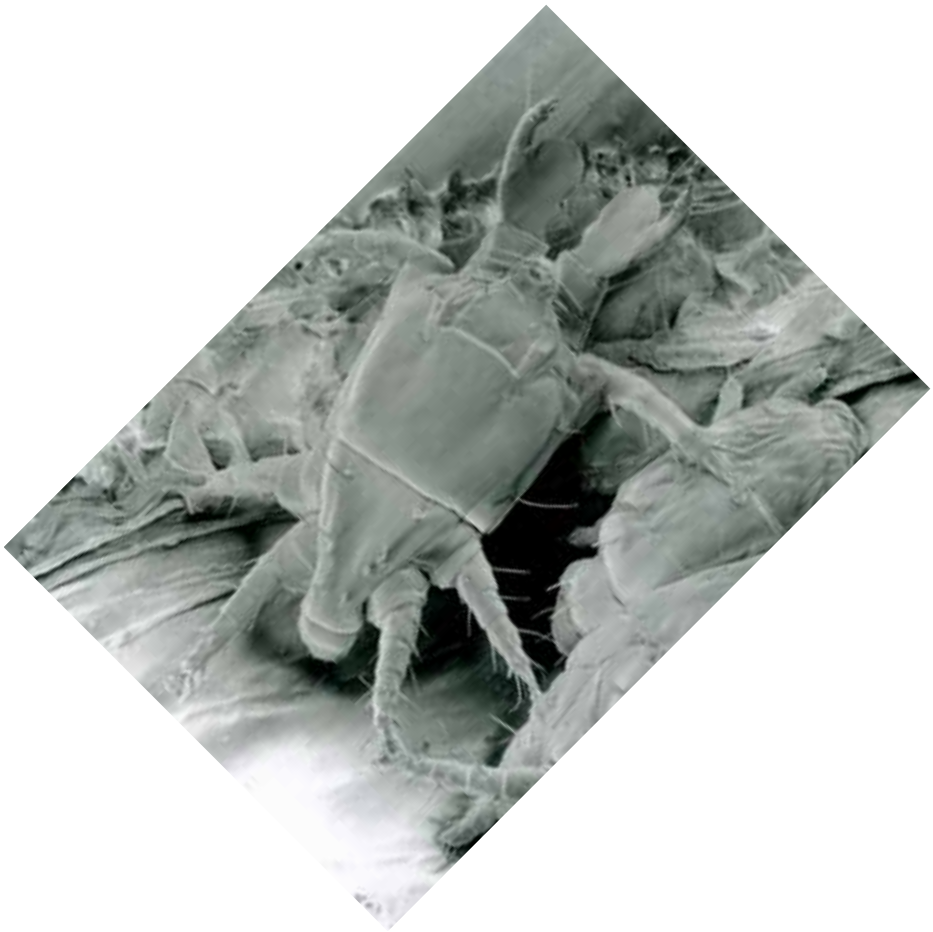
United States Department of Agriculture

Animal and Plant Health Inspection Service

Cooperating State Departments of Agriculture

Panicle Rice Mite Program Manual



First Edition Issued 2009

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Cover Image

Panicle Rice Mite—male panicle rice mite (*Steneotarsonemus spinki)*. Courtesy of Eric McDonald, USDA–APHIS–PPQ.

1 Introduction

Panicle Rice Mite

Contents

Purpose

Use the *Panicle Rice Mite Program Manual* as a guide when designing a program to detect, monitor, control, contain, or eradicate an infestation of this pest.

If panicle rice mite (*Steneotarsonemus spinki* Smiley) (PRM) is detected in the United States, PPQ will produce a site-specific action plan based on the *Program Manual*. State agriculture department personnel and others concerned with developing local survey or control programs will also use the *Program Manual*. Any new detection may require the establishment of an incident command system to facilitate emergency management.

United States Department of Agriculture (USDA)–Animal and Plant Health Inspection Service (APHIS)–Plant Protection and Quarantine (PPQ) developed the *Program Manual* through discussion, consultation, or agreement with staff at USDA–Agricultural Research Service (ARS), universities, industries, and State departments of agriculture.

The *Program Manual* will be updated as new information becomes available. Specific emergency programs should be based on information available at the time of the incident.

Pest Status

The following reasons are justification for classifying panicle rice mite as a significant import threat to the United States:

PRM can indirectly transmit the fungus that causes sheath rot (*Acrocylindrium oryzae* Sawada) as well as other plant pathogens, and may act as a vector for the organisms

PRM is a pest of economic importance to field and greenhouse crops of rice in its native habitat in Asia, where it directly damages rice grain, resulting in yield losses of 5 to 90 percent

PRM is difficult to detect because symptoms are not always apparent

PPQ established a Federal Domestic Quarantine which prohibits movement of rice plants and plant parts, including untreated seed from Puerto Rico to the mainland United States due to the presence of PRM

Document Comprehension

This document is not intended to be complete and exhaustive but provides a basic foundation, based upon the literature available, to assist further work. Some key publications were not available at the time of writing, and not all specialists and members of the research community were consulted in the preparation of this document.

Commercial Suppliers or Products

Any references to commercial suppliers or products should not be construed as an endorsement of the company or product by USDA.

Preventing Infestations

Federal and state regulatory officials must conduct inspections and apply prescribed measures to ensure this pest does not spread within or between properties. Officials conducting inspections should follow the sanitation guidelines in **Sanitation** on **page 3-2** before entering and upon leaving each property to prevent spreading contaminated plant material or tools to other facilities.

Program Safety

Safety of the public and program personnel is a priority in pre-program planning and training and throughout program operations. Safety officers and supervisors must enforce on-the-job safety procedures.

Support for Program Decisionmaking

USDA–APHIS–PPQ–Center for Plant Health, Science and Technology (CPHST) provides technical support to emergency pest response program directors concerning risk assessments, survey methods, control strategies, regulatory treatments, and other aspects of pest response programs. PPQ managers consult with State departments of agriculture in developing guidelines and policy for pest response programs.

Users of the *Panicle Rice Mite Manual*

This manual will serve both as a field manual for employees performing program activities and as a reference for program managers and staff officers. Primary users of this manual will be Plant Protection and Quarantine (PPQ) officers, staff officers, and State and Federal cooperators who are involved in carrying out the Panicle Rice Mite Program on a day-to-day basis.

Secondary users of the manual are Federal, State, county, and local regulatory officials, private industry, and part-time employees temporarily assigned to program activities.

How to Use this Manual

Conventions are established by custom and are widely recognized and accepted. Conventions used in this *manual* are listed below.

Chapters

The *Panicle Rice Mite Program Manual* contains the following chapters: *Introduction, Pest Information, Survey Procedures, Identification, Regulatory Procedures, Control Procedures,* and *Environmental Compliance*. It also has a list of forms, a list of tables, a glossary, six appendixes, and an index.

Table of Contents

Every chapter has a table of contents that lists the heading titles at the beginning to help facilitate finding information.

Control Data

Information placed at the top and bottom of each page helps users keep track of where they are in the *manual*. At the top of the page is the chapter and first-level heading. At the bottom of the page is the month, year, title, and page number. PPQ–Emergency and Domestic Programs (EDP) is the unit responsible for the content of the *Panicle Rice Mite Program Manual*.

Conventions

The major conventions used in this manual follow.

This is a DANGER table. Indicates that people can easily be hurt or killed.

This is a WARNING table. Indicates that people could possibly be hurt or killed.

This is a CAUTION table. Indicates that people could possibly be endangered and slightly hurt.

This is a NOTICE table. Indicates a possibly dangerous situation, goods might be damaged.

This is an IMPORTANT table. Indicates helpful information.

An example, when used, will appear in a box as follows.

EXAMPLE: Examples are graphically placed in boxes within text as a means of visually separating this information from other information contained on the page.

Reporting Problems

If you disagree with the guidelines or policies contained in this manual and the problem is urgent, contact Domestic and Emergency Operations.

Domestic and Emergency Operations, Unit 134
4700 River Road
Riverdale, MD 20737
Tel: (301) 734-8247
Fax: (301) 734-8584

If you disagree with the guidelines or policies and the problem is **not** urgent, contact Domestic and Emergency Operations through the proper channels.

Maintenance of the Manual

The most up-to-date version of the Manual will always be available online at the PPQ Manuals Unit Web site. The PPQ Manuals Unit issues announcements for immediate manual updates via email. These will be numbered consecutively—allowing you to know if you have missed something.

The email is distributed to all PPQ employees and the email transmittal contains the following information:

Hyperlink to the Manuals Unit Web site to download the entire manual

List of the revised pages (and/or tables) by number and purpose of the revision(s)

Knowing What Is Revised

Except for changes to the Index, revisions will be marked with change bars (black boxes) in the left margin of the changed page.

2

Panicle Rice Mite

Pest Information

Contents

Introduction

Use *Chapter 2 Pest Information* to learn more about the classification, history, host range, and biology of the panicle rice mite (*Steneotarsonemus spinki* Smiley) (PRM).

Classification

Use **Table 2-1** as an aid to the classification of the panicle rice mite.

Table 2-1 Classification of Panicle Rice Mite

Phylum	Chelicerata
Subclass	Acari (Acarina)
Order	Acariformes
Family	Tarsonemidae
Subfamily	Tarsoneminae
Tribe	Steneotarsonemini
Scientific name	*Steneotarsonemus spinki* Smiley
Common names	panicle rice mite rice panicle mite rice tarsonemid mite spinki mite

History

The panicle rice mite has been a recognized pest of rice throughout the rice-growing regions of Asia since the 1970s, and historical reports of crop damage dating back to the 1930s have also been attributed to the mite. Although the species was described from specimens collected from Louisiana in association with the planthopper species *Sogata orizicola* Muir (=*Tagosodes orizicolus* (Muir) (Hemiptera: Delphasidae)), there are no confirmed reports of this mite infesting U.S. rice crops, and all attempts to re-collect the mite in Louisiana have failed. As such, the mite is **not** believed to occur in the United States.

During the last decade, PRM has established itself in the Caribbean Region, including parts of Central America. It was first reported from Cuba in 1997 and in subsequent years was found in the Dominican Republic and Haita. The first mainland reports of PRM for Central America occurred in 2003 from Panama, and it has since spread to Costa Rica in 2004; and Nicaragua, Honduras, and Guatemala in 2005. Very low populations of PRM were also reported from Colombia in 2005, marking the first South American record (Kane 2007).

Distribution

Panicle rice mite has been reported from Kenya, China, Taiwan, India, Japan, Korea, Philippines, Cuba, Dominican Republic, Haiti and Colombia. PRM was detected in Arkansas, Louisiana, New York, Texas, and Puerto Rico (USDA–APHIS–PPQ 2007a-e).

Dispersal

Important

It is possible that panicle rice mite has been dispersed on infested seed or on a planthopper. Because PRM symptoms were observed on leaves of young plants that were raised from infested seed material, its transmission from seed to plant is possible (Rao *et al.* 2000). Because the initial description was from a planthopper (*Sogata orizicola*) collected in Louisiana (Smiley 1967), long-distance dispersal of this mite on planthoppers is a probability (Ou, Fang, and Tseng 1977).

Host Range

The primary host plants for PRM are in the genus *Oryza*, particularly *Oryza sativa* (cultivated paddy rice) and *Oryza latifolia* (weedy red rice). Adult PRM have been observed on numerous weeds such as *Cyperus iria* in rice paddies, but **no** eggs have been observed on plants other than *Oryza* species.

Economic Impact

Panicle rice mite is a pest of economic importance to field and greenhouse crops of rice in its native habitat in Asia, where its feeding directly damages rice grain, resulting in yield losses of 5–90 percent. PRM can also cause indirect damage to rice crops by transmitting plant pathogens.

Amended NPAG Report:

Steneotarsonemus spinki Smiley: Rice panicle mite Acari/ Tarsonemidae
Date submitted to the PPQ Permit Unit: March 26, 2004
NPAG Chair Amendment Approval Date: January 3, 2008

Potential economic and environmental impacts, trade implications:
Steneotarsonemus spinki is a major pest of rice in China, the Philippines and Taiwan (Smiley et al. 1993). When population levels are low, S.

spinki is typically found feeding on internal surfaces of leaf sheaths, but when populations are high, the mite can be found on all plant parts, including the kernel (Chow et al. 1980, Ramos and Rodríguez 2001). Symptoms, such as necrotic bands and spots, develop on rice grains and leaf sheaths when populations are large, and populations greater than 450 mites per cm2 have been recorded (Ramos and Rodríguez 2001). In addition to reducing the value of the rice by scarring the kernel, S. spinki can reduce yield by transmitting the fungus, Acrocylindrium oryzae Sawada, and the mycoplasma-like organism, Spiroplasma citri Saglio et al., which both cause rice sterility (CABI, last modified March 2000 and 2001, respectively, Chow et al. 1980, Ochoa 2004b). Ramos and Rodríguez (2001) estimated that the combined activities of S. spinki feeding and disease transmission lowered rice yield in Cuba by 30-60%. Steneotarsonemus spinki should not be a major problem of rice grown in the continental US because economic damage has not been reported from any temperate rice growing regions of the world where S. spinki has been detected (Schall 2004), and the mite is believed to be unable to overwinter in temperate rice growing regions (Ochoa 2004a). Steneotarsonemus spinki could however be a problem in rice grown in Puerto Rico (Schall 2004).

Damage

In China and Taiwan, where two crops of rice per season can be grown, panicle rice mite can transmit the fungus that causes sheath rot (*Acrocylindrium oryzae* Sawada). The production of a second rice crop in Taiwan is curtailed because of high sterility of the rice plants caused by the mite-induced sheath rot (Chow *et al.* 1980a; 1980b).

In southern Taiwan, yield losses due to rice sterility induced by this mite have been severe (Lee 1980). The area of infestation in the second crop increased from 17,100 hectares (42,237 acres) in 1976 to 19,146 hectares (47,290 acres) (about 4.5 percent of the total cropping area) in 1977. The percentage of empty grains (including partially filled grains) ranged from 20 percent to around 60 percent, with a grain loss equivalent to 20,000 metric tons, valued at US $9,200,000 (Chen, Cheng, and Hsaio 1979).

In India, spikelet sterility or grain discoloration was observed in 24 villages that were observed in the West and East Godavari districts of Andhra Pradesh in the 1999 wet season. The symptom had a patchy distribution in 23 villages and 1–21 percent of the rice area was affected; in the other village, 50 percent of the rice was affected (Rao *et al*. 2000).

Damage to Host Plants

The primary host plants for panicle rice mite are in the genus *Oryza*, particularly *Oryza sativa* (cultivated paddy rice) and *Oryza latifolia* (weedy red rice). In China and Taiwan, PRM causes the following damage to host plants:

- Empty and partially filled grains with associated grain loss
- Spikelet sterility or grain discoloration
- Transmission of a fungus that causes sheath rot of rice

In India:

- Affected glumes had brownish to black lemmata and palae and shriveled ovaries (Rao and Das 1977)
- Rice plants that had poorly exserted earheads and necrotic leaf sheaths were found to have panicle rice mites between the stem and the leaf sheath

In Korea, feeding by this mite caused the following symptoms:

- Browning of rice hulls (Cho *et al.* 1999)
- Deformed panicles and inflorescences
- Lesions on the inner surfaces of leaf sheaths

Associated Pests

Rice Sheath Rot Fungus

In Taiwan, in addition to its direct damage, PRM usually carries spores of rice sheath rot fungus (*Acrocylindrium oryzae* Sawada). Infection by the rice sheath rot fungus causes brownish spots on the rice sheath and grain. This condition is known as sterile grain syndrome. The syndrome is manifested by the following:

- Impaired grain development resulting in empty or partially filled grains with diseased brown spots and the panicles standing erect (Chen, Cheng, and Hsiao 1979)
- Loose and brownish flag leaf sheath
- Twisted panicle neck

Panicle Rice Mite and Other Pests

During a survey in India (Rao *et al.* 2000), four types of visual symptoms were observed on affected plants:

Mite damage alone

Mite + saprophytic fungus

Mite + saprophytic fungus + sheath rot fungus

Mite + white-tip nematode + other saprophytic fungal damage

After a careful examination of many samples, the researchers concluded that PRM was the primary pest in all cases.

Rice Tarsonemid Mite Virus

A disease caused by the rice tarsonemid mite virus (RTMV) is associated with a sheath browning and grain sterility syndrome of rice in Japan and the Philippines. The virus is transmitted by panicle rice mite. The virus particles are orbicular, 35 x 16 nm, and the genome consists of two single-stranded RNA segments. RTMV is not systemic and only occurs in the epidermal and mesophyll cells of the leaf sheaths and hulls of the kernels where the mites are present. RTMV is probably a mite virus that can also reproduce in plant cells (Shikata *et al*. 1984; Webster and Gunnell 1992).

Fungus *Sarcocladium oryzae*

Artificial inoculation of the fungus *Sarcocladium oryzae* (=*Acrocylindrum oryzae*) onto rice was achieved in China and Japan in the 1940s and 1950s (Ou 1972). Chien and Huang (1979) showed inoculation to be difficult unless the rice was first injured by the attack of mites; their *in vitro* tests indicated that several fungicides are effective (CABI-CMI No. 673 1980).

Chien (1980) found that many conidia of *Sarcocladium oryzae* were on the bodies of the panicle rice mites; pure cultures of the fungus could be obtained from the bodies, ecdysed exuviae, or eggs of the mites. Rice plants inoculated with both the mite and the fungus were more heavily infected than those inoculated with either the mite or the fungus alone (Chien 1980).

Sarcocladium oryzae is present on seeds from sterile rice plants; no diseased seedlings resulted when infected seed was planted. The fungus survived 110 days in diseased straw piled in the field and more than 75 days in stubble standing in the field. After being buried in wet soil, the fungus declined rapidly and was undetectable after 25 days (Hsieh, Shue, and Liang 1980). Besides *Sarcocladium oryzae*, PRM transmits a mycoplasma-like organism resembling *Spiroplasma citri* (Chow *et al.* 1980b).

Life Cycle

Panicle rice mite develops in four life stages: egg, larva, inactive larva, and adult. Under laboratory conditions (about 24 °C) (75 °F), PRM multiplies rapidly; the duration of the life cycle ranges from 5 to 9 days from egg to adult (**Table 2-2**) (Ramos and Rodriguez 2001, 2000)

Table 2-2 Developmental Time of Egg and Larval Stages of Panicle Rice Mite Under Laboratory Conditions[1]

	Developmental Time (Days)		
Instar	**Minimum**	**Maximum**	**Average**
Egg	1.75	4.77	2.94 (± 1.18)
Larva	2.02	2.87	2.22 (± 0.39)
Inactive larva	2.00	3.95	2.47 (± 1.37)
Total	**5.75**	**11.59**	**7.77 (±1.56)**

1 24 °C (75.2 °F)

According to Tseng (1985), the duration of the life cycle varies from 16 to 17 days at 25 °C (77 °F). However, in Cuba the life cycle was lessened by approximately 50 percent, which indicates that Cuba has favorable climatic conditions as well as susceptible varieties. Under these conditions, PRM is more important as a pest (Ramos and Rodriguez 1998). At 25 °C , 28 °C, and 30 °C (77 °F, 82.4 °F, and 86 °F), this mite required 17, 4, and 2.5 days, respectively, to complete its life cycle (Chen, Cheng, and Hsiao 1979). At 20 °C and 30 °C (68 °F and 86 °F), this mite required at least 20 days and not more than 3 days, respectively, to complete its life cycle (Lo and Ho 1980).

This mite is facultatively parthenogenetic; both sexual and asexual reproduction is possible. In the Philippines, the life cycle was completed in six days. Virgin females laid only a few eggs which gave rise exclusively to males (Sogawa 1977). The descendants of virgin females were males, but the mother female could mate with its male offspring and then produce both females and males.

Under field conditions in Taiwan, populations of the mite first appeared about early May, increased in size between August and October, and declined thereafter until harvest. The mite survived the cool temperatures of winter either in stubble or ratoon rice (Lo and Ho 1980; Lo and Ho 1979a).

Eggs

The eggs of PRM are translucent white, ovoid and elongated (Ramos and Rodroguez 1998). At 20 °C and 30 °C (68 °F and 86 °F), females lay on average 20.0 eggs and 59.5 eggs, respectively (Lo and Ho 1980; Lo and Ho 1979a). Experiments in Cuba, using the Perla de Cuba rice variety and a temperature of 24.8 °C (76.6 °F), found that females on average laid 4.9 eggs per day for a total of 27.7 eggs per female (Santos *et al.* 2001). In the Philippines, females laid about 15 eggs per day for five days (Sogawa 1977).

Larvae

Like the eggs, larvae are translucent white. The larvae are elongated (Ramos and Rodriguez 1998).

Inactive Larvae

This phase is also a translucent white. The larvae which will become adult females are transported by the (adult) males, as is common in other species in the Family Tarsonemidae (Ramos and Rodriguez 1998).

Adult Males

In Smiley's (1967) original description, the male of this species was characterised by the following:

> Pair of daggerlike setae on femur and genu IV
>
> Short, stout, blunt spurlike seta on tibia III

In Korea, males are characterized by (1) the anterior ends of apodemes II extended further than apodemes IV, (2) femur IV had a large inner median lateral flange, (3) inner anterior and outer median setae were short, about equal in length, and (4) the tarsal claw was stout and curved ventrally (Cho *et al.* 1999).

According to the initial description (Smiley 1967), the body of the male is elongated and broadest in the anterior region of the hysterosoma; in addition, the body is 217 microns long and 121 microns wide. In Cuba, the males were 217 microns in length and 120 microns in width (Ramos and Rodriguez 1998). In Korea, the males were 196.5 microns in length and 109.3 microns in width (Cho *et al.* 1999).

Adult Females

The body of the female is elongate and broadest in the region of the hysterosoma (Smiley 1967). In Cuba, the females were 272 microns in length and 109 microns in width (Ramos and Rodriguez 1998). In Korea, the females were 263.0 microns in length and 92.4 microns in width; the body was pale brown (Cho *et al.* 1999). The legs were robust except for the IV legs, which were typical tarsonemid female legs terminating in a whip-like seta two times the width of femur IV (Cho *et al.* 1999, Smiley *et al.* 1993).

Detailed Description

The initial description of panicle rice mite was by Smiley (1967); detailed drawings were included with the description. After the detection in Cuba, Ramos and Rodriguez (1998) again described PRM. Identification drawings of other *Steneotarsonemus* species are in *Mites Injurious to Economic Plants* (Jeppson, Keifer, and Baker 1975) and in an illustrated key to grass-infesting species (Smiley *et al.* 1993).

Ecology

Research on ecological factors found that growth of the panicle rice mite was favored by: (1) temperatures between 25.5 °C and 27.5 °C and (77.9 °F and 81.5 °F); and (2) humidity between 83.8 percent and 89.5 percent (Miranda Cabera, Ramos, and Fernandez 2003). In India, this mite was found to infest rice plants throughout the year. The population fluctuated between a maximum during November (586.70-633.30 mites/tiller) and a minimum during February (44.30–52.70 mites/tiller). The population was greatest at the booting stage and declined thereafter as the plant matured. Correlation studies indicated that population increases were favored by low rainfall and high temperature (Ghosh, Rao, and Prakash 1997, 1999). Sterility was positively correlated with the number of mites/tiller and the percentages of mites per panicle (Lo and Ho 1979b, Lo and Ho 1977).

This mite is highly sensitive to humidity. The mortality rate increased within the range of 25–32 °C (77–89.6 °F), as the temperature increased and the relative humidity decreased. In general, if the relative humidity is less than 40 percent and if the temperature is above 30 °C (86 °F), all mites will die within 4 hours; if the temperature is within the range of 25–28 °C (77–82.4 °F), all mites will die within 6 hours. Hence, temperatures in the range of 28–30 °C (82.4–86 °F), with a relative humidity above 80 percent, are optimal for this mite (Chen, Cheng, and Hsiao 1979). The reader should keep in mind the temperatures and humidity levels in the microclimate which the mite exists and not necessarily the environemtnal conditions of the rice crop or field.

3 Survey Procedures

Panicle Rice Mite

Contents

Introduction

Use *Chapter 3 Survey Procedures* as a guide when conducting a pest survey for the panicle rice mite (*Steneotarsonemus spinki* Smiley) (PRM). Plant regulatory officials will conduct detection, delimiting, and monitoring surveys for this pest. Detection surveys are performed to ascertain the presence or absence of a pest in an area where it is not known to occur. Delimiting surveys are performed to define the extent of an infestation. Monitoring surveys are performed to determine the success of control or mitigation activities conducted against a pest.

Precautions

Before beginning a survey, follow the precautions in this section concerning sanitation, pesticide applications, quarantines, and private property.

Sanitation

When visiting greenhouses or fields to conduct surveys or take samples everyone, including regulatory officials, must take strict measures to prevent contamination by PRM between properties during inspections. Before entering a new property make certain that footwear and clothing are clean and free of soil to avoid moving soil-borne pests from one property to another.

Dispersal

Important

It is possible that panicle rice mite has been dispersed on infested seed or on a planthopper (*Sogata orizicola*). Because PRM symptoms were observed on leaves of young plants that were raised from infested seed material, its transmission from seed to plant is possible (Rao *et al.* 2000). Additionally, because the initial description was from a planthopper collected in Louisiana (Smiley 1967), long-distance dispersal of this mite on planthoppers is a probability (Ou, Fang, and Tseng 1977).

Wear protective outerwear such as a Dupont Tyvek® suit and remove it before moving to the next greenhouse, field, or property. The suit helps to prevent the spread of PRM.

Pesticide Applications

Determine if there have been recent pesticide applications that would make it unsafe to inspect the greenhouse or rice fields. Check with property owners or managers for this information. Look for posted signs indicating recent pesticide applications, particularly in commercial fields or greenhouses. See Control Procedures on **page 6-1** for related information concerning pesticides.

Quarantines

Determine if any quarantines are in effect for other pests of rice or other crops in the area being surveyed. Comply with all quarantine requirements.

Private Property

Obtain permission from the landowner before entering a new property. See Regulatory Procedures on **page 5-1** for related information.

Detection Survey

Conduct a detection survey in areas where panicle rice mite is **not** known to occur. The survey can be broad in scope as when assessing the presence of the pest over large distances, or it can be restricted to determining if a specific pest is present in a focused area.

Sensitivity

Positive results indicate that PRM is present. However, negative results do **not** necessarily mean that PRM is absent. Negative results can be used to provide clues about mode of dispersal, temporal occurrence, or industry practices. Negative results are also important when compared with results from sites that are topographically, spatially, or geographically similar. Recording negative results in surveys is just as important as positive detections since it helps define an area of infestation.

A survey designed with a known sensitivity can provide a probability that a population over a given size does **not** exist in an area.

General Detection Survey

Conduct a general survey for PRM. A general detection survey for PRM can include visual observation for pest damage or mites, or collection of plant tissue for dissection, depending on the location. See **Visual Inspection** on **page 3-5** and see **Collection of Plant Tissue Samples** on **page E-1** for additional information about using these survey tools.

Targeted Survey

Targeted areas are also known as hot zones or demographic areas. Conduct a targeted survey for PRM in greenhouses where rice is produced and rice fields associated with high risk pathways.

Delimiting Survey

After a new detection, or if a new area is confirmed positive for this pest, conduct a delimiting survey of hosts in commercial and research field and rice greenhouse properties in the area. Use traceback and trace forward investigations to determine priorities for delimiting survey activities after an initial detection of PRM. See Traceback and Trace Forward Investigation on **page 3-4** for related information.

Surveys should be most intensive around the known positive detection(s) and any discovered through traceback and trace forward investigations. These surveys should include greenhouse fields so that results can be mapped to develop potential regulatory boundaries.

Survey task forces should include an experienced survey specialist, an entomologist or acarologist familiar with the mite and symptoms caused by the mite, and personnel responsible for sample collection and properly recording the data and GPS coordinates.

Monitoring Survey

After control or eradication procedures are conducted, it is necessary to do follow-up monitoring surveys to measure the success of the program. The duration of monitoring should be determined in consultation with the National Program Manager, Regional Program Manager, and the PRM Technical Working Group. See Technical Working Group on **page ix** for a list of TWG members.

Traceback and Trace Forward Investigation

Conduct traceback and trace forward investigations if you need to determine priorities for delimiting survey activities after an initial detection of PRM. Traceback investigations help to determine if an isolated detection is spurious, or if it is evidence of an established population. Trace forward investigations attempt to define the potential for dissemination through means of natural and artificial spread. Artificial spread is the commercial or private distribution of infected plant material.

List of Facilities With Infected Stock

For rice hosts in greenhouses, a list of facilities associated with infected greenhouse stock from those testing positive for PRM will be compiled by State regulatory officials. The lists will be distributed by the State to the field offices.

Names of growers and locations of greenhouses and fields on the lists are strictly confidential, and any distribution of lists beyond appropriate regulatory agency contacts is **prohibited**. Each State is only authorized to see locations within their State and sharing of confidential business information may be restricted between State and Federal entities. Check the privacy laws with the State Plant Health Director for the State.

Address	http://www.aphis.usda.gov/services/report_pest_disease/report_pest_disease.shtml

When notifying growers on the list, be sure to identify yourself as a USDA or State regulatory official conducting an investigation of facilities that may have received PRM infested material. Speak to the growers or farm managers and obtain permission before entering private property.

Several actions need to occur immediately upon confirmation that a greenhouse or field sample is positive for PRM:

Check greenhouse records to obtain names and addresses for all sales or distribution sites (if any sales or distribution has occurred from infested greenhouse) during the previous six months

See **Regulatory Procedures** on **page 5-1** and **Control Procedures** on **page 6-1** for related information

Visual Inspection

Damage to rice plants by panicle rice mite is **not** necessarily visible in the field or greenhouse. However, symptoms caused by pathogens in association with PRM can be visible. If any symptoms are observed, document the site for more focused sampling. *See* **Damage to Host Plants** on **page 2-5** for diagnositic images.

Fields in Rice-Producing States

Use the survey procedures described in this section for both delimiting and detection surveys conducted in rice in commercial or research fields.

Selection of Sites

Fields with the following characteristics are more likely to have been exposed to mites and may be easier to access:

Fields near paved roads. These fields are likely to have been chosen for scouting purposes. Within these fields, choose logical points of entry that may have been used for scouting in the past

Fields near roads (especially dirt roads) that are traveled by equipment

Fields that are bordered by levees

Sample Timing

Table 3-1 Timing of Sampling in Fields in Rice-Producing States

If this location:	And:	Then:	And:	Then survey when:
Fields in rice producing States	PRM was not previously confirmed in or near the field	Detection survey	SURVEY 5% of fields within the State	The majority of rice plants within the field are at the heading to milk stage and see **Sample Timing** on **page 3-6**.
	• Fields were previously confirmed for PRM; and • Fields are in close proximity to previously positive fields	Delimit survey	SURVEY field and a minimum 3 associated fields	Rice plants are in the seedling stage and see **Sample Timing** on **page 3-6**.

Samples should be collected when the majority of rice plants within the field are at the heading to milk stage, when mite populations are expected to be at their greatest. At this time, the panicle is fully exerted beyond the boot and symptoms of panicle blight and other panicle disorders are observable.

Determine when rice will be at this physiological stage in your State and conduct sampling during those weeks. Sampling at these stages will ensure the highest likelihood of collecting the mite if an infestation is present. In ratoon crops, sampling at earlier physiological stages of rice is an option.

In previously positive fields and fields in close proximity to previously positive fields, sampling can begin at the seedling stage. For these fields, if the mite is present, populations would be expected to be higher than in newly infested fields. If the mites were able to survive the winter, then the mites will likely be present on the seedlings.

These recommendations are based on the biology of the mite and promote sampling during plant growth stages when mite populations are expected to be highest. However, States may adjust the timing of sample collection to accommodate the safety of inspectors, differences in rice production techniques within their States, and other factors as necessary.

By sampling at the seedling stage, surveyors may find an infestation early enough to provide eradication or management options to the grower and possibly save the crop. This would provide an incentive for grower cooperation in the survey.

If **no** mites are found at the seedling stage, then the survey should be repeated during the heading to milk stage.

Sampling Unit

Collect three tillers, preferably with panicles, from each sampling location within the field. By collecting tillers instead of whole plants, the amount of collected plant material will not vary as greatly between hybrid and conventional plants and between varieties.

Sampling Universe

The sampling universe is each individual field.

For this survey, an individual field is defined as an area planted to rice (regardless of the number of varieties), with a physical separation of more than 5 feet from other rice fields by canals, berms, roads, or other physical attributes.

Number of Locations per Field

In fields that may have been recently infested by PRM, the PRM population density may still be small and difficult to detect.

In order to detect a new, possibly small infestation of PRM, take as many samples as possible. Ideally, 300 samples would be collected per field which would provide a 95 percent confidence level of detecting a 1 percent infestation level, assuming a 100 percent extraction efficiency of the sample.

However, feasibility, logistics, fiscal and personnel resources, and safety has determined a target detectable infestation level of 5 percent. Therefore, 59 samples should be collected per field to provide a 95 percent confidence level at this percentage level.

The detectable infestation level will increase as the number of samples collected decreases; therefore, smaller infestations may be less likely to be detected (**Table 3-2**)

.

Table 3-2 Relationship Between Detectable Infestation Level of Panicle Rice Mite and Number of Samples Collected per Field[1]

Detectable infestation level of panicle rice mite (%)	1	2	3	4	5
Number of samples per field (95 % confidence level)	300	149	99	74	59

1 Assuming an unknown distribution of PRM within the field and a 100 percent extraction efficiency of the sample.

Method

Collect samples along the field perimeter. Include the four corners of the field and the water inlet/outlet.

If it is prohibitive to sample from all sides of a field (due to the presence of canals or other obstacles) samples should be distributed evenly between the sides of the perimeter that are accessible.

Little is known about PRM distribution within newly infested fields. Therefore, when only sampling the perimeter of the field, we can only be confident about detecting a PRM infestation in the perimeter.

If the surveyor is able to identify bacteria panicle blight (*Burkholderia glumae*) and sheath rot (*Sarocladium oryzae*), the surveyor should collect approximately 10–20 percent of the total number of samples from plants showing symptoms of either of these two diseases. If the surveyor is not familiar with rice diseases and their symptoms, sample collection should not be biased towards plants with damage. Multiple diseases and other causes of damage that are not related to PRM infestations may be present in the field and this could impact sampling results.

Resampling Positive Fields

If only one mite is detected in a field, inspectors should return to the field and re-sample. One mite could be the result of contamination and therefore may be an isolated incident. Inspectors should re-sample using the same sampling method described above and collect the same number of samples.

Processing

See **Protocols** on **page E-1** for related information.

Greenhouses

Selection of Sites

Panicle rice mite is most likely to be detected in greenhouses that follow these management practices:

- Continuous cropping of rice without rotation
- Cultivation of varieties of rice that are more susceptible to attack by this pest
- Locating plantings near fields or greenhouses that have tested positive
- Mixing of young and older rice plantings in the same vicinity

Survey greenhouses that meet the following criteria:

With permits to import rice

Found previously positive for PRM

Received material from the positive greenhouse and any that are associated (in a traceback or trace forward investigation)

All others as deemed necessary

Timing

Inspectors should sample greenhouses once per month. In lieu of monthly inspections, the inspector may place the greenhouses under a Compliance Agreement. In this case, a customized sampling schedule can be created on a case-by-case basis depending on the risk level. See Establishing a Federal Regulatory Area or Action on **page 5-5** for related information.

Research in China and other countries suggests that field sampling should be conducted in late summer, when the tillers have filled and harvest is about to begin. This is usually when the populations of PRM are at a peak and detection is most likely.

For those fields where ratoon cropping occurs, this cycle may not be as important, with more green material available at other times of the year (such as during the second ratoon crop).

In fields and around fields that had high infestation rates in late Summer of 2007, fields were sampled soon after the second leaf stage.

Sample Unit

The sampling unit is one tiller per plant. Collect only tillers that are not needed for research/breeding as identified by the researcher.

Sample Universe

The sampling universe is the individual research block. An individual research block should be sampled instead of the entire greenhouse because of the likely differences in plant varieties and maturity.

Method

Inspectors should perform both visual inspection and sample collection during each monthly survey in each research block in the greenhouse.

Visual Inspection

Inspectors should familiarize themselves with the size and visual characteristics of PRM before performing surveys. *See* Identification on **page 4-1** for related information.

Inspectors should examine one tiller per plant on 50% of plants on the perimeter of each research block, focusing on plants with an unhealthy appearance. To examine each tiller, unroll the sheath and inspect the plant down to the node (if possible) with a 20X hand lens.

Collect any suspicious-looking mites by placing a section of the infested leaf sheath in 70 percent ethanol for identification. *See* **Preservation, Screening, and Shipment** on **page E-4** for related information.

Sample Collection

Researchers at each greenhouse should identify tillers for sampling. Inspectors should collect only tillers not needed for research. Researchers should focus on plants with an unhealthy appearance.

Inspectors should collect one tiller per plant from 10% of plants in a research block, as identified by the researcher. If any suspicious samples were taken during the visual survey, the inspector can count those as part of the 10% collected total.

If a greenhouse is confirmed positive during the current year survey or from the prior year, the inspector may use sentinel plants for sampling. If sentinel plants are used, they should be sampled prior to miticide treatments. Sampling prior to spraying is necessary to determine if mites are present prior to application.

4 Identification

Panicle Rice Mite

Contents

Introduction

Use *Chapter 4 Identification* as a guide to identifying the panicle rice mite (*Steneotarsonemus spinki* Smiley) (PRM). Accurate identification of a pest is pivotal to assessing its potential risk, developing a survey strategy, and determining the level and manner of control.

Authorities

Screening and Identification

Separation of panicle rice mite from other mites requires special training. A National Authority recognized by USDA–APHIS–PPQ–National Identification Services (NIS) for panicle rice mite must positively identify the

suspected pest before initiation of containment, control, regulatory, or eradication activities. Dr. Ronald Ochoa is the national authority for panicle rice mite.

Address

Dr. Ronald Ochoa
Systematic Entomology Laboratory
Room 008
10300 Baltimore Avenue
Bldg. 005 BARC-West
Beltsville, MD 20705-0000
Email: ron.ochoa@ars.usda.gov
Telephone: 301-504-7890
Fax: 301-504-6482

Other trained identifiers may be given identification authority to make adult determinations within the program, but they must abide by guidelines set under various permits and authorizations maintained by PPQ.

See **Protocols** on **page E-1** for related information.

Plant Protection Act

PPQ permit and registration requirements for plant pests fall under the Plant Protection Act (7 CFR Part 330). Plant Protection Act permit requirements apply to all plant pests and infected plant material, including diagnostic samples, regardless of their quarantine status. If any material is shipped interstate, the receiving laboratory must have a permit.

For further guidance on permitting of plant pest material, consult PPQ Permit Services or visit the Web site of the PPQ–Permits Program.

Address

PPQ–Permits Program
Web site: http://www.aphis.usda.gov/plant_health/permits/plantproducts.shtml
Telephone: 301-734-8758

Characteristics

Eggs

Eggs share the following characteristics:

Color translucent white

Shape ovoid and elongated (Ramos and Rodroguez 1998)

Larvae

Larvae share the following characteristics:

Color translucent white

Shape elongated (Ramos and Rodriguez 1998).

Inactive Larvae

Inactive larvae are translucent white.

Adult Males

According to the initial description (Smiley, 1967), adult males are characterized by the following:

Body shape elongated and broadest in the anterior region of the hysterosoma

Body size 217 microns long and 121 microns wide

Femur and genu IV with a pair of daggerlike setae

Tibia III with a short, stout, blunt spurlike seta

According to Cho *et al.* (1999), in Korea adult males are characterized by the following:

Anterior ends of apodemes II extend further than apodemes IV

Body size 196.5 microns in length and 109.3 microns in width

Femur IV with a large inner median lateral flange

Inner anterior and outer median setae short, about equal in length

Tarsal claw stout and curved ventrally

According to Ramos and Rodriguez (1998), in Cuba the males were 217 microns in length and 120 microns in width (Ramos and Rodriguez 1998).

Adult Females

According to Smiley (1967), adult females are characterised by the following:

Body shape elongate and broadest in the region of the hysterosoma

In Korea, the females were 263.0 microns in length and 92.4 microns in width; the body was pale brown (Cho *et al.* 1999). The legs were robust except for the IV legs, which were typical tarsonemid female legs terminating in a whip-like seta two times the width of femur IV (Cho *et al.* 1999, Smiley *et al.* 1993).

According to Ramos and Rodriguez (1998), in Cuba the females were 272 microns in length and 109 microns in width.

Handling Samples

Collection and Storage

Collect tillers from the field or greenhouse. Tillers with seeds attached to stems are preferred for diagnostic testing since the mite is often found under the seed panicle. The entire plant above the soil or water line (Based upoon growing conditions) should be sampled.

Place plant samples with paper towels in resealable plastic bags, and then squeeze as much of the air out of the bag as possible before sealing. Include dry paper towels in the bag with the sample to absorb moisture.

Keep plant samples cool but not frozen, preferably in an ice chest, while transferring them and waiting for preparation for mailing to the diagnostic laboratory. Write the sample ID number legibly using a permanent marker on the bag.

Extraction and Preparation

Mite specimens will be extracted from plant samples at PPQ and State offices/ laboratories with the State of origin. *See* **Protocols** on **page E-1**.

Check with your regional office if a diagnostic laboratory to extract the samples is unavailable.

Packaging and Documentation

Ship mite specimens by overnight delivery Monday through Thursday. Saturday delivery may not be accepted unless special arrangements with the receiving laboratory are made prior to shipping.

Ice packs are **not** needed or recommended.

Package all extracted samples in a resealable, leak proof bag. Place the bag in a sturdy cardboard box with sufficient insulation to prevent movement within the box during shipping. Include the completed **PPQ Form 391 Specimens for Determination** on **page C-2**, and any relevant tags or barcodes that came with the sample.

Only send samples by overnight delivery Monday through Thursday. Saturday delivery may not be accepted unless special arrangements with the receiving laboratory are made prior to shipping.

Labeling, Numbering, and Record Keeping

An Integrated Survey Information System (ISIS) data collection system for survey and sample collection has been developed. The Incident Commander or Program officials should provide the appropriate equipment for recording the sample collection information.

Record all composite samples on the same PPQ Form 391. List the subsample numbers on the form.

The submitter should complete and include a hard copy of the PPQ Form 391 inside the outside bag of double-bagged samples. Assign and record for each sample a unique ID sample number with a predetermined format. Assure that the sample is linked to any survey data collected for that sample by including the Survey ID number on the form. This will enable the linkage of the sample to all the field collection information.

See **Integrated Survey Information System** on **page F-1** for related information.

Approved Identification of PRM

Once plant samples have been washed and extractions made:

- Isolate the mites on slides or in vials of 70 percent ethyl alcohol
- Forward suspect PRM with PPQ Form 391 to PPQ identifier in Humble, Texas
- Notify the regional program manager in your region and the laboratory by email that the shipment is being sent with the overnight and provide the tracking number

The first suspect panicle rice mite positives from a new State or county will be considered Potentially Actionable Suspect Samples (PASS), until confirmed by the USDA–Systematic Entomology Laboratory in Beltsville, MD. An inconclusive result, any suspect positive from a new host, or other unexpected or unusual find should also be treated as PASS samples.

This laboratory does **not** have all the necessary permits or containment protocols to handle the sample extractions. Please only send extracted samples in vials with 70 percent ethanol or mites mounted on slides to this facility.

5

Panicle Rice Mite

Regulatory Procedures

Contents

Introduction

Use *Chapter 5 Regulatory Procedures* as a guide to the procedures that must be followed by regulatory personnel when conducting pest survey and control programs against the panicle rice mite (*Steneotarsonemus spinki* Smiley) (PRM).

Instructions to Officers

Officers must follow instructions for regulatory treatments or other procedures when authorizing the movement of regulated articles. Understanding the instructions and procedures is essential when explaining procedures to persons interested in moving articles affected by the quarantine and regulations. Only authorized treatments can be used in accordance with labeling restrictions.

Find instructions for regulatory treatments in the *PPQ Treatment Manual*.

Issuing an Emergency Action Notification

Issue PPQ 523 Emergency Action Notification (EAN) (see an example of PPQ Form 523 Emergency Action Notification on **page C-7**) under the following circumstances:

- Plant material must be held in fields pending positive identification of suspect samples
- Suspected plant material is directly or indirectly connected to positive confirmations

Once an investigation determines the plant material is **not** infested, or testing determines there is **no** risk, the material may be released and the release documented on the EAN.

The EAN may also be issued to hold plant material in fields pending positive identification of suspect samples. When a decision to destroy plants is made, or in the case of submitted samples, once positive confirmation is received, the same EAN which placed plants on hold also is used to document any actions taken, such as destruction and disinfection. Additional action may be warranted in the case of other fields or greenhouses testing positive for PRM.

If necessary, the Deputy Administrator will issue a letter directing PPQ field offices to initiate a specific emergency action under the Plant Protection Act of 2000 until emergency regulations can be published in the *Federal Register.*

Emergency Quarantine Action

The Plant Protection Act of 2000 provides for authority for emergency quarantine action. This provision is for interstate regulatory action only. Intrastate regulatory action is not Federally mandated and provided under State authority.

However, if the Secretary of Agriculture determines that an extraordinary emergency exists and that the measures taken by the State are inadequate, USDA can take intrastate regulatory action provided that the governor of the State has been consulted and a notice has been published in the *Federal Register.*

If intrastate action cannot or will not be taken by a State, PPQ might find it necessary to quarantine an entire State.

Access to Private Property

PPQ works in conjunction with State departments of agriculture to conduct surveys, enforce regulations, and take control actions. PPQ employees must have permission of the property owner before accessing private property.

If an extraordinary emergency is declared or if a warrant is obtained, PPQ can enter private property without owner permission. PPQ prefers to work with the State to facilitate access when permission is denied; however, each State government has varying authorities regarding accessing private property. A General Memorandum of Understanding (MOU) exists between PPQ and each State. PPQ officers must have permission of the owner before accessing private property. For clarification, check with your State Plant Health Director (SPHD) or State Plant Regulatory Official (SPRO) in the affected State.

Cooperation with Tribal Governments

PPQ works with Federally recognized Indian tribes to conduct surveys, enforce regulations and take control actions. Each tribe stands as a separate governmental entity (sovereign nation) with powers and authorities similar to State governments. Permission is required to enter and access Tribal lands.

Executive Order 13175, Consultation and Coordination with Indian and Tribal Governments, States that agencies must consult with Indian Tribal governments about actions that may have substantial direct effects on tribes. Whether an action is substantial and direct is determined by the tribes. Effects are not limited to current Tribal land boundaries (reservations) and may include effects on off-reservation land or resources which tribes customarily use or even effects on historic or sacred sites in States where tribes no longer exist.

Consultation is a specialized form of communication and coordination between the Federal government and Tribal government. Consultation must be conducted early in the development of a regulatory action to ensure that tribes have opportunity to identify resources which may be affected by the action and to recommend the best ways to take actions on Tribal lands or affecting Tribal resources. Communication with Tribal leadership follows special communication protocols.

For additional information, contact PPQ's Tribal liaison or visit the the APHIS Native American Working Group Web site. To determine if there are sacred or historic sites in an area, contact the State historic preservation officer (SHPO).

Addresses

APHIS Native American Working Group:
http://www.aphis.usda.gov/anawg

State historic preservation officer:
http://www.nps.gov/history/nr/shpolist.htm

Overview for Regulatory Program

If plant lots or shipments are held as separate units, issue separate EANs for each unit of suspected plant material and associated material held. EANs are issued under the authority of the Plant Protection Act of 2000 (statute 7 USC 7701-7758). States are advised to issue their own hold orders parallel to the EAN to ensure that plant material cannot move intrastate.

When using EANs to hold articles, it is most important that the EAN language clearly specify actions to be taken. An EAN issued for positive testing and positive-associated plant material must clearly state that the material must be disposed of, or destroyed, and areas disinfected. Include language that these actions will take place at the owner's expense and will be supervised by a regulatory official. If the EAN is used to issue a hold order for further investigations and testing of potentially infested material, then document on the same EAN, any disposal, destruction, and disinfection orders resulting from investigations or testing.

Regulated Articles

Once initial detections of panicle rice mite are confirmed in an area (positive research or commercial rice field or greenhouse with predetermined buffer area around positive finds after a thorough delimiting survey), regulated articles include all live host plant material in that area. Whole live plants, stems, leaves, and seeds are regulated.

Panicle rice mite is spread by seed and fresh propagative plant material. Another potential pathway is hitchhiking on personnel, equipment, and insects coming in contact with infested rice plants. Steps should be taken to ensure that proper sanitation around exists in infested greenhouses to include sanitation of all personnel and equipment that comes into contact with plant material.

The following regulated articles are hosts and possible carriers of PRM and are restricted and subject to regulatory treatments in areas where the the mite has been detected:

Cyperus iria

Oryza latifolia (red rice or wild red rice)

Oryza sativa

Shipment of Host Plant Material

Shipment of host plant material from a greenhouse or field that is under EAN for panicle rice mite is prohibited unless the rice seed is treated with an APHIS-approved treatment. *See* **Control Procedures** on **page 6-1** for related information.

Regulated Areas

The regulated area will consist of the area under the EAN and a specified buffer around that area. If a greenhouse is found to be infested with PRM and placed under EAN, then the head house of the greenhouse and areas surrounding the greenhouse (especially outside of any air handling equipment) will be placed under restrictions. These restrictions may include a designated host-free area and entry and exit sanitation requirements for personnel and equipment.

Grower Requirements Under Regulatory Control

Depending upon decisions made by Federal and State regulatory officials in consultation with the PRM Technical Working Group, quarantine areas may have certain other requirements for commercial or research rice fields in that area, such as plant removal and destruction, mite cultural control measures, or plant waste material disposal.

Establishing a Federal Regulatory Area or Action

Regulatory actions undertaken using EANs continue to be in effect until the prescribed action is carried out and documented by regulatory officials. These may be short-term destruction or disinfestation orders or longer term requirements for growers that include prohibiting the planting of host crops for a period of time. Over the long term, producers, shippers, and processors may be placed under compliance agreements and permits issued to move regulated articles out of a quarantine area or property under an EAN.

Results analyzed from investigations, testing, and risk assessment will determine the area to be designated for a Federal and parallel State regulatory action. Risk factors will take into account positive testing, positive associated, and potentially infested exposed plants. Boundaries drawn may include a buffer area determined based on risk factors and epidemiology.

Removing Areas from Regulatory Control

If investigations determine the regulatory restrictions on fields are adhered to over the prescribed time periods, actions are documented and fields can be released from regulatory restrictions. Notify growers that their fields may be subject to additional monitoring by State or Federal officials for the presence of PRM. Furthermore, permit requirements for rice greenhouses may be changed to include additional seed treatments to prevent accidental introduction of PRM to the field.

6 Control Procedures

Panicle Rice Mite

Contents

Introduction

Use *Chapter 6 Control Procedures* as a guide to controlling the panicle rice mite (*Steneotarsonemus spinki* Smiley) (PRM). Consider all possible methods of control before beginning a program.

Control measures in this chapter were organized according to rice growing location (field or greenhouse) and primary use (consumption, production of seed, or for use by researchers). Use **Table 6-1** to identify and locate control information pertinent to your program.

Table 6-1 Decision Table To Identify and Locate Control Information

If controlling panicle rice mite in:	Then go to this section in this chapter:
Rice grain grown in fields primarily for consumption by people or animals[1]	**Grain for Consumption on page 6-4**
Rice seed grown in fields primarily for the production of more seed, or for use by researchers	Seed for Production or Research Planting on **page 6-6**
Any rice grown in fields for grain or seed and testing positive for panicle rice mite[2]	Positive Grain and Seed Fields on **page 6-10**
Rice seed grown in greenhouses[3]	Greenhouses on **page 6-11**

1 Some rice grain and/or by-products may be added to feed for animals, or may be discarded.

2 The field itself tested positive for PRM where the rice was grown.

3 Primarily lines of rice grown by plant breeders.

Laws Pertaining to Pesticide Use

The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) authorizes the Environmental Protection Agency (EPA) to regulate pesticides. All persons using and applying pesticides should understand the laws pertaining to pesticide use and application. The following are provisions of FIFRA that are most pertinent to emergency pest control programs:

- Restricted use pesticides must be applied by a certified applicator
- Use of any pesticide inconsistent with the label is prohibited
- Violations can result in heavy fines or imprisonment.

States can register pesticides on a limited basis for special local needs according to the following Sections:

Section 18—EPA administrators can exempt Federal or State agencies from FIFRA if it is determined that emergency conditions exist that require such exemptions

Section 24e—A State can provide registration for additional uses of Federally registered pesticides formulated for distribution and use within that State to meet special local needs in accordance with the purposes of this act.

For additional information concerning exemptions, see the *PPQ Emergency Programs Manual*. Contact staff at USDA–APHIS–PPQ–Emergency and Domestic Programs–Environmental Compliance to assure that any pesticide

being considered as part of an eradication program conforms to pesticide use requirements. Obtain all required environmental documentation before beginning.

Address Emergency Programs Manual
http://www.aphis.usda.gov/import_export/plants/manuals/emergency/downloads/epm.pdf

Address USDA–APHIS–PPQ–Emergency and Domestic Programs–Environmental Compliance
http://www.aphis.usda.gov/regulations/compliance/environmental_guidance.shtml

Environmental Monitoring

Environmental monitoring is an important consideration in all programs. Contact staff in PPQ–Emergency and Domestic Programs–Environmental Compliance to learn if environmental monitoring is required. Environmental Compliance staff may evaluate environmental impact by monitoring the following:

Foliage, to identify residues

Nontarget organisms before, during, and after applications, to determine impact of pesticides

Soil, to determine insecticide levels and residues

Water, to detect insecticide levels resulting from direct application, leaching, and runoff

Address USDA–APHIS–PPQ–Emergency and Domestic Programs–Environmental Compliance
http://www.aphis.usda.gov/regulations/compliance/environmental_guidance.shtml

Records

Program personnel must maintain records and maps noting the locations of all detections, the number and type of treatments, and the materials and formulations used in each treated area.

Control Decisions and Oversight

All regulatory actions related to destruction are to be witnessed, supervised, and documented by a Federal and/or State plant regulatory official whenever possible. Proper supervision and documentation of destruction of infected plant material is critical. If a PPQ representative is not available, a State cooperating inspector can witness and document the disposal.

Grain for Consumption

Source

Information in this section was revised from the following source: Treatment Recommendations for Panicle Rice Mite (*Steneotarsonemus spinki*). Panicle Rice Mite Technical Working Group. October 12, 2007 USDA–APHIS–PPQ. [http://www.aphis.usda.gov/plant_health/plant_pest_info/rice_mite/downloads/treatment.pdf]

Use the procedures in this section when harvesting, processing, storing, transporting or disposing of rice grain for consumption from fields for which an Emergency Action Notification has been issued.

See Issuing an Emergency Action Notification on **page 5-2** for related information concerning EANs.

Harvesting and Processing

Implement the safeguards described in **Table 6-2** to minimize dispersal of PRM during harvesting and processing of rice grain for consumption from fields for which an Emergency Action Notification has been issued.

Table 6-2 Safeguards for Minimizing Dispersal of Panicle Rice Mite During Harvesting and Processing Operations

If PRM can be moved on:	Then implement the following safeguards to minimize dispersal of PRM and prevent re-infestation of the crop:
Personnel working in the field and at the processor	When working in areas or with materials that were previously exposed to PRM: • Remove outer clothing and replace with clean clothing[1] • Spray clothing with 70% ethanol • Utilize disposable outerwear such as Dupont Tyvek® suits Avoid entering fields **not** known to contain PRM after entering a greenhouse or field previously found positive for PRM without taking the appropriate safeguards.
Grain harvesting and processing equipment	Use either steam treatment (preferred) or high pressure washing to sanitize harvesting, tillage, or other farm equipment after field operations in EAN fields are completed or at the end of the work day, which ever is first.
Rough rice grain	During processing, use a hot air process whereby the rough rice enters a concrete tumbler dryer which has hot air forced through it. Maintain the temperature of rice grain at or near 100° F with humidity in the tumbler below 40 percent relative humidity (i.e. temperatures and relative humidity appropriate for commercial grain drying).[2] Follow the efficacy of treatment procedure in ***Table 6-3*** on **page 6-6** to confirm that hot air processing has eradicated PRM in infested fields of rice.
Seed processing by-products including but not limited to rice hulls, sweeps, broken and heavy grain	Dispose of by-products by deep burial at a minimum depth of six feet. Do **not** spread by-products as a mulch or otherwise introduce them back into the field.[3] During processing or transport operations, safeguard by-products.
Equipment used to processs rice	Use steam treatment (preferred) or high pressure washing to sanitize equipment that will be used again for non-infested grain or seed.

1 Wash clothing in hot water for more than 10 minutes after exposure to fields previously found positive for PRM.

2 Exposure to this level of heat for this time period is expected to kill any PRM that are associated with the grain, and no further treatment of the processed grain or grain by-products is necessary.

3 Processed grain and grain by-products will be sampled to confirm that hot air processing killed PRM from infested fields.

Efficacy of Hot Air Treatment

Use the procedure in **Table 6-3** to confirm that hot air treatment has eradicated PRM in infested fields of rice.

Table 6-3 Efficacy of Hot Air Treatment for Control of Panicle Rice Mite in Rice Grain for Consumption

If this product:	Then sample as follows in each field:	And if PRM is:	Then hot air treatment was:
Grain	1. Randomly take 10 X 50 g samples of processed grain to make up one approximately 500 g composite per field. 2. Draw three subsamples from the composites. 3. Use a microscope to examine the sub-samples and confirm the effectiveness of processing to kill PRM on harvested grain.	Absent	Successful
		Present	Unsuccessful
Grain by-products (hulls, bran, and defective grains)	1. Randomly take 10 X 50 g samples of each by-product to create one 500 g composite of hulls, one 500 g composite of bran, and one 500 g composite of defective grains per field. 2. Draw three subsamples from the composites. 3. Use a microscope to examine the sub-samples and confirm effectiveness of processing to kill PRM on grain by-products.	Absent	Successful
		Present	Unsuccessful

Storage or Moving

Implement the safeguards in **Table 6-4** to minimize dispersal of PRM when transporting or storing rice grain for consumption from fields for which an Emergency Action Notification has been issued.

Table 6-4 Safeguards for Minimizing Dispersal of Panicle Rice Mite During Transportation and Storage Operations

If PRM can be moved on:	Then implement the following safeguards to minimize dispersal of this pest:
Grain transportation equipment	Use either high pressure washing or steam treatment (preferred) to sanitize equipment used to transport, unload, and process the rice from infested fields.
Rice grain in storage	Maintain grain at a moisture content of 14 percent moisture or less.

Seed for Production or Research Planting

Source

Information in this section was revised from the following source: Treatment Recommendations for Panicle Rice Mite (*Steneotarsonemus spinki*). Panicle Rice Mite Technical Working Group. October 12, 2007 USDA–APHIS–PPQ. [http://www.aphis.usda.gov/plant_health/plant_pest_info/rice_mite/downloads/treatment.pdf]

Harvesting and Processing

Implement the safeguards described in **Table 6-2** to minimize dispersal of PRM during harvesting and processing of rice seed grown in fields primarily for the production of more seed, or for use by researchers for which an Emergency Action Notification (EAN) has been issued.

See Issuing an Emergency Action Notification on **page 5-2** for related information concerning EANs.

Table 6-5 Safeguards for Minimizing Dispersal of Panicle Rice Mite During Harvesting and Processing Operations

If PRM can be moved on:	Then implement the following safeguards to minimize dispersal of PRM and prevent re-infestation of the crop:
Personnel working in the field and at the processor	When working in areas or with materials that were previously exposed to PRM: Remove outer clothing and replace with clean clothing[1] Spray clothing with 70% ethanol Utilize disposable outerwear such as Dupont Tyvek® suits Avoid entering fields **not** known to contain PRM after entering a greenhouse or field previously found positive for PRM without taking the appropriate safeguards.
Rice seed	Process the rice according to standard processing practices and treat in individual, gas-permeable bags using one of the following methods: Phosphine on **page 6-8** Methyl Bromide on **page 6-8** Cold Treatment on **page 6-9**

1 Wash clothing in hot water for more than 10 minutes after exposure to fields previously found positive for PRM.

Moving and Storage

Implement the safeguards described in **Table 6-6** to minimize dispersal of panicle rice mite during transportation and storage of rice seed grown in fields primarily for the production of more seed, or for use by researchers for which an Emergency Action Notification (EAN) has been issued.

See Issuing an Emergency Action Notification on **page 5-2** for related information concerning EANs..

Table 6-6 Safeguards for Minimizing Dispersal of Panicle Rice Mite During Transportation and Storage Operations

If PRM can be moved on:	Then implement the following safeguards to minimize dispersal of this pest:
Grain transportation equipment	Use either high pressure washing or steam treatment (preferred) to sanitize equipment used to transport, unload, and process the rice from infested fields.
Rice grain in storage	Maintain grain at a moisture content of 14% moisture or less.

Phosphine

In recent efficacy trials, rice stems infested with live panicle rice mite were exposed to phosphine[1] at an initial dosage of 30–90g/1000 ft^3, at NAP (normal atmospheric pressure) in a chamber at greater than 83 °F for 72 hrs.

No live mites were retrieved after phosphine treatment, nor were live mites detected after six days of incubation after treatment, indicating phosphine's effectiveness on adults, nymphs and eggs of PRM. Live mites were detected in untreated infested control stems up to six days after collection and initiation of experiments. The treatment would likely be similarly effective if used to treat infested rice seed, although experimental evidence for seed is not yet available. During fumigation, sacks of seed should be elevated off the floor level and placed on pallets in a single layer to facilitate even application of the fumigant.

To be effective, phosphine should be applied at a rate in the range of 750–2250 ppm/1000 ft^3 at the discretion of the fumigator dependent on the leakage of the fumigation structure. Treatment concentration readings should not fall below the minimum 350 ppm/1000 ft^3 over the 72 hours. (Readings should be taken at 24, 48, and 72 hours to document treatment.)

Methyl Bromide

Rice stems infested with live PRM were treated with methyl bromide at 1.25 lbs /1000 ft^3, at normal atmospheric pressure in a chamber for 12 hours at greater than 80 ºF. Non-infested rice seed was exposed to each methyl bromide treatment to assess impact on germination. Germination rates varied from 0 percent to 82 percent and averaged 37 percent compared to no treatment with a germination rate of 53 to 97 percent and averaged 86 percent. No live mites were retrieved after methyl bromide treatment or after six days of incubation after treatment, demonstrating methyl bromide's effectiveness on adults, nymphs and eggs of PRM. Live mites were detected in untreated infested control stems up to six days after collection and initiation of experiments. The treatment would likely be similarly effective if used to treat infested rice seed, although experimental evidence for seed is not yet available.

Methyl bromide treatment should be applied when the seed's moisture content is 14.2–8.9% ensuring a germination rate of 93–92%, respectively. (*See **Table 6-7** on **page 6-9*** for higher temperature recommendations and rates.) During fumigation, sacks of seed should be elevated above the floor and placed on pallets in a single layer to facilitate even application of the fumigant.

1 The intent of the PRM Technical Working Group preparing this guideline is to allow flexibility in the form of phosphine used for rice fumigation. Fumigators may use either the aluminum- or magnesium-forms of phosphine applied in gas, liquid or tablet form, as long as the guidelines for treatment outlined are met.

Table 6-7 Methyl Bromide Fumigation of Rice Seed for 12 Hours: Recommendations for Control of PRM[1]

		Minimum concentration of methyl bromide (ounces)	
Temperature (°F)	Dosage Rate (lb/ 1,000 ft^3)	Seed moisture (%)	Germination (%)
50	5	17.0	9
50	5	14.2	93
50	5	8.9	92
51–65	4	17.0	27
51–65	4	14.2	95
51–65	4	8.9	94
≥80	1.25	—	80

1 In the interest of seed quality, PPQ–CPHST–Treatment Quality Assurance Unit (TQAU) recommends all rice varieties be tested using the recommended methyl bromide treatments. These treatment recommendations are not for bulk seed. Since these treatments have **not** been tested for panicle rice mite, TQAU does not accept legal responsibility for damage to rice seed or control failure resulting from the above recommended treatments. Source: CPHST TQAU research documentation.

Cold Treatment

Rice stems infested with live panicle rice mite were treated at -8 ºC for 72 hours. No live mites were retrieved after cold treatment or after six days of incubation after treatment, demonstrating the cold treatment effectiveness on adults, nymphs and eggs of PRM. Live mites were detected in untreated infested control stems up to six days after collection and initiation of experiments.

The treatment would likely be effective if used to treat infested rice seed, although experimental evidence for seed is not yet available. This treatment would likely be most feasible for small scale treatment of seed.

Table 6-8 Comparison of Cold Treatment and No Treatment of Panicle Rice Mite

Cold treatment		Number of mites	
Temperature	Hours	0 days	6 days
—8 ºC	72	No live mites	No live mites
Ambient (Control)	72	Live mites present	Live mites present

Efficacy of Treatments

Use the sampling procedure in **Table 6-9** to confirm that phosphine, methyl bromide, cold treatment, and storage treatments have effectively eradicated PRM in infested grain for production or research planting.

Table 6-9 Efficacy of Treatments In Rice Grain for Production or Research of Grain for Producion or Research Planting for Control of Panicle Rice Mite

If this commodity:	Then sample as follows in each field:	And if PRM is:	Then hot air treatment was:
Processed grain	1. Randomly take 10 X 50 g samples of processed grain to make up one approximately 500 g composite per field. 2. Draw three subsamples from the composites, 3. Use a microscope to examine the sub-samples and confirm the effectiveness of processing to kill PRM on harvested grain.	Absent	Successful
		Preset	Unsuccessful
Grain by-products (hulls, bran, and defective grains	1. Randomly take 10 X 50 g samples of each by-product to create one 500 g composite of hulls, one 500 g composite of bran, and one 500 g composite of defective grains per field. 2. Draw three subsamples from the composites. 3. Use a microscope to examine the sub-samples and confirm effectiveness of processing to kill PRM on grain by-products.	Absent	Successful
		Present	Unsuccessful

Safeguarding

Seed should be shipped as needed. Implement the safeguards described in *Table 6-2* on **page 6-5** to prevent re-infestation of treated seed.

Positive Grain and Seed Fields

Source Information in this section was revised from the source: Treatment Recommendations for Panicle Rice Mite (*Steneotarsonemus spinki*). Panicle Rice Mite Technical Working Group. Oct 12, 2007 USDA–APHIS–PPQ. [http://www.aphis.usda.gov/plant_health/plant_pest_info/rice_mite/downloads/treatment.pdf]

Implement the safeguards described in this section to minimize dispersal of panicle rice mite on any rice grown in fields for grain or seed and testing positive for PRM for which an Emergency Action Notification (EAN) has been issued.

See Issuing an Emergency Action Notification on **page 5-2** for related information concerning EANs.

Burn, if possible, and then disk the stubble soon after harvest where the soil can be worked. Repeat disking at two-week intervals as needed to further break down stubble and kill volunteer plants and weeds

Control volunteer rice plants and alternate hosts (*Oryza sativa*, *Oryza latifolia*, and *Cyperus iria*) by applying the appropriate herbicide to the field and buffer area or by other mechanical means where herbicides are **not** permitted

Establish a host free area buffer at a minimum of 25 feet around the perimeter of each positive field. A greater distance is preferred when possible

Follow the sanitation procedures in ***Table 6-2*** on **page 6-5** for keeping workers and equipment pest free

Rotate rice with a nonhost crop, (*i.e.*, soybean, grain sorghum, etc.) or leave the field fallow for three months or longer. Ideally, do **not** plant rice after rice or use ratoon cropping. Fields should be fallow and free of rice or alternate hosts of PRM for a minimum of three months

Scout fields at regular intervals during the fallow period to assure that **no** PRM hosts are growing. Personnel working in fields and greenhouses should be made aware of the mite and the symptoms it can cause on rice

Greenhouses

Source Information in this section was revised from:
Treatment Recommendations for Panicle Rice Mite (*Steneotarsonemus spinki*). Panicle Rice Mite Technical Working Group. Oct 12, 2007 USDA–APHIS–PPQ. [http://www.aphis.usda.gov/plant_health/plant_pest_info/rice_mite/downloads/treatment.pdf]

Implement the safeguards described in this section to minimize dispersal of PRM on any rice seed grown in greenhouses and testing positive for PRM for which an Emergency Action Notification (EAN) has been issued.

See Issuing an Emergency Action Notification on **page 5-2** for related information concerning EANs.

Take these steps to disinfest the entire greenhouse facility:

Step 1: Follow the safeguards described in Table 6-10

Step 2: Apply one of the following treatments

Table 6-10 Safeguards for Minimizing Dispersal of Panicle Rice Mite on Rice Seed Grown in Greenhouses

If PRM can be moved on:	Then implement the following safeguards to minimize dispersal of PRM and prevent re-infestation of the crop:
Personnel working in the field and at the processor	Avoid entering greenhouses **not** known to contain PRM after entering a greenhouse or field previously found positive for PRM without taking the appropriate safeguards Post notices at entrances about the infestation Restrict movement of personnel, plant material, and equipment into or out of the greenhouse unless precautions are taken to prevent movement of PRM outside of the infested greenhouse When working in areas or with materials that were previously exposed to PRM: Remove outer clothing and replace with clean clothing[1] Spray clothing with 70% ethanol Utilize disposable outerwear such as Dupont Tyvek® suits
Harvested rice seed	Treat harvested seed: Seed may be harvested but must be treated according to instructions below for Seed (rice for planting, for either production or research use).
Grain growing, harvesting, and processing equipment	Clean and disinfect Items in the infested greenhouse (such as pots, tools, lab coats, etc. that may harbor PRM) to eliminate the mite Use either steam treatment (preferred) or high pressure washing to sanitize harvesting, tillage, or other farm equipment after field operations in EAN fields are completed or at the end of the work day, which ever is first
Rough rice grain	During processing, use a hot air process whereby the rough rice enters a concrete tumbler dryer which has hot air forced through it Follow the efficacy of treatment procedure in ***Table 6-3*** on **page 6-6** to confirm that hot air processing has eradicated PRM in infested fields of rice Maintain the temperature of rice grain at or near 100 °F with humidity in the tumbler below 40% relative humidity (i.e., temperatures and relative humidity appropriate for commercial grain drying)[2]
Seed by-products including but not limited to rice hulls, sweeps, broken and heavy grain	After harvest, remove and dispose of harvested plant material, other than seed, by bagging and autoclaving, double bagging and deep burial, or by incineration Dispose of by-products by deep burial at a minimum depth of six feet Do **not** spread by-products as a mulch or otherwise introduce them back into the field[3] During processing or transport operations, safeguard by-products

1 Wash clothing in hot water for more than 10 minutes after exposure to fields previously found positive for PRM.

2 Exposure to this level of heat for this time period is expected to kill any PRM that are associated with the grain, and no further treatment of the processed grain or grain by-products is necessary.

3 Processed grain and grain by-products will be sampled to confirm that hot air processing killed PRM from infested fields.

Plant Free Period

1. Destroy, remove, and dispose of all plant material and potting medium in the infested greenhouse and within a five foot host-free buffer zone outside of the infested greenhouse.
2. Treat greenhouse with appropriate, labeled disinfectant.
3. Wait one month before planting hosts of PRM in these greenhouses to interrupt the life cycle of the mite and prevent reinfestation. During the waiting period, planting of noninfested dicotyledonous plants is permitted.
4. Continue to follow safeguarding measures in ***Table 6-10*** on **page 6-12** to prevent reinfestation.
5. Only treated seed or seed that did not originate from an infested greenhouse can be used in the greenhouse to prevent reinfestation related to seed source.
6. Continued monitoring for the pest is recommended at the discretion of the greenhouse facility management.

Steam Heat

Source *PPQ Treatment Manual*, Treatment Schedules T400 - Schedules for Miscellaneous Products, T408—Soil as Such and Soil Contaminating Durable Commodities: T408-f
http://www.aphis.usda.gov/import_export/plants/manuals/ports/downloads/treatment_pdf/05_05_t400schedules.pdf

1. Destroy, remove, and dispose of all plant material and potting medium in the infested greenhouse and within a five foot host-free buffer zone outside of the infested greenhouse.
2. Continue to follow safeguarding measures in ***Table 6-10*** on **page 6-12** to prevent reinfestation.
3. Use steam treatment to treat infested surfaces and equipment.
4. Planting of hosts of PRM may resume after the cumulative exposure time at the minimum temperature has been reached.
5. Only treated seed or seed that did not originate from an infested greenhouse can be used in the greenhouse to prevent reinfestation related to seed source.
6. Continued monitoring for the pest is also recommended, at the discretion of the greenhouse facility management.

Methyl Bromide

Source *PPQ Treatment Manual*, Treatment Schedules T400 - Schedules for Miscellaneous Products. T403—Miscellaneous Cargo (Nonfood, Nonfeed Commodities): T403-e-1-1
http://www.aphis.usda.gov/import_export/plants/manuals/ports/downloads/treatment_pdf/05_05_t400schedules.pdf

Fumigate the greenhouse with methyl bromide to eliminate remaining mites in the structure. The methyl bromide treatment recommended to provide quarantine security is T403-e-1-1. The agency does not have any mortality data to reduce the exposure times listed on this treatment. Treatment rate is dependent upon temperatures during exposure. Treatment duration is 12 hours.

Control Records

Also attach any documentation, receipts, etc. that document these actions. Program personnel must maintain records and maps noting the locations of all detections, the number and type plants subjected to control actions, and the materials and formulations used in each treated area. Attach all documentation to the office EAN copy.

7

Panicle Rice Mite

Environmental Compliance

Contents

Introduction

Use *Chapter 7 Environmental Compliance* as a guide to environmental regulations pertinent to the panicle rice mite (*Steneotarsonemus spinki* Smiley) (PRM).

A key element in designing a program or an emergency response is consultation with Environmental Services (ES), a unit of APHIS' Policy and Program Development Staff (PPD). ES prepares environmental documentation such as environmental impact statements (EIS) and environmental assessments (EA) to aid in program operational decisions, as well as Endangered Species consultation. ES also coordinates pesticide registration and approvals for APHIS programs, ensuring that registrations and approvals meet program use needs and conform to pesticide use requirements. In addition, PPQ's Environmental Compliance Team (ECT) assists ES in the development of required documentation and implements any environmental monitoring that may be required of program activities.

Environmental Compliance
Environmental Monitoring, Categorical Exclusions

Address

USDA–APHIS–PPQ–Emergency and Domestic Programs
Environmental Compliance
4700 River Road, Unit 150
Riverdale, MD 20737
Telephone: 301-734-8247

Environmental Services
FIFRA, ESA, Environmental Assessments

Address

USDA–APHIS–Policy and Program Development
Environmental Services
4700 River Road, Unit 149
Riverdale, MD 20737
Telephone: 301-734-8565

Disclaimer

All uses of pesticides must be registered or approved by appropriate Federal, State, or Tribal agencies before application. Pesticide labels might not reflect all State or local restrictions. Read and abide by the label, including labeling that has been approved for the particular State or locality. Comply with all Federal, State, Tribal, and local laws and regulations relating to the use of the pesticides. APHIS program staffs are responsible for their compliance with applicable environmental regulations. Laws Pertaining to Pesticide Use on **page 6-2** for more information.

National Environmental Policy Act

The National Environmental Policy Act (NEPA) requires that Federal agencies document the potential adverse effects of their actions. The process often requires public input. The exact nature of the documentation and public involvement is dictated by the potential for adverse effects and the significance of those effects.

It is likely that most pest control responses will include actions that need up to 30 days of public comment prior to initiation. Therefore, it is imperative to involve Environmental Services and Environmental Compliance early in the planning process. Doing so assures public involvement and a quick response.

Depending on the proposed program, NEPA requirements will be met with a categorical exclusion, environmental assessment, or environmental impact statement. Some programs can prepare their own NEPA documentation. Contact Environmental Services or Environmental Compliance if you are unsure which document should be prepared, or if you have little experience writing such documents.

Endangered Species Act

The Endangered Species Act (ESA) requires that all Federal actions, including emergency responses, do not harm Federally protected threatened or endangered species. Before an action can begin, it must be determined if protected species are in the project area. If such species are present, measures must be put in place to protect them from potential adverse effects of the action. Such work requires coordination with the U.S. Fish and Wildlife Service and/or the National Marine Fisheries Service.

Several methods are available to ensure compliance with ESA, but the exact one chosen is dictated by the nature of the emergency, proposed response, and location. As soon as possible in the early stages of the response, contact staff at Environmental Services or Environmental Compliance, who can provide the necessary guidance and support in conducting the necessary analyses and developing the required documentation.

Federal Insecticide, Fungicide, and Rodenticide Act

The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) requires that chemicals used for control have approved labels and that all label requirements are followed. These requirements can include applicable uses, maximum application rates, handling instructions, and personal protective equipment. If no label is available for the emergency in question (i.e., the pest of concern is not listed as one for which the chemical may be used), it is possible to obtain a new label or a label exemption. If a label change is needed or no label can be located for your program needs, immediately contact Environmental Services, who can assist in label changes and emergency use exemptions.

Other Laws

The National Environmental Policy Act, Endangered Species Act, and the Federal Insecticide, Fungicide, and Rodenticide Act, are of critical importance to all pest control programs, but other laws may apply depending on program locations and activities. These include the Migratory Bird Treaty Act, the Coastal Zone Management Act, and the Bald and Golden Eagle Protection Act. By including Environmental Services and Environmental Compliance early in program planning, guidance can be provided on meeting the requirements of these and other laws that may apply.

Environmental Monitoring

Environmental monitoring of APHIS pest control activities may be required as part of compliance with the above laws, as requested by program managers, or as suggested to address concerns with controversial activities. This is especially true for less benign chemical controls and aerial application of chemicals.

Monitoring may be conducted with regards to worker exposure, quality assurance and control, off-site deposition, or program efficacy. Different tools and techniques are used depending on the monitoring goals, program chemicals, and control techniques. Environmental monitoring is coordinated by Environmental Compliance (EC). Staff from EC will work with the program manager to develop an environmental monitoring plan, conduct training to implement the plan, provide day-to-day guidance on monitoring, and provide an interpretive report of monitoring activities.

Appendix A

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B

Panicle Rice Mite

Appendix B

Resources

Contents

Diagnostic Tools and Equipment

Ben Meadows—http://www.benmeadows.com/

Fisher Scientific—http://www.fishersci.com/wps/portal/HOME?LBCID=13684862

VWR—http://www.vwrsp.com/

Environmental Compliance

Table B-1 Environmental Compliance Contact Information

Category:	Contact information:
Environmental monitoring, categorical exclusions compliance	USDA–APHIS–PPQ–Emergency & Domestic Programs Environmental Compliance 4700 River Road, Unit 150 Riverdale, MD 20737 Tel: (301) 734-8247
Environmental services, FIFRA, ESA, environmental assessments	USDA–APHIS–Policy & Program Development Environmental Services 4700 River Road, Unit 149 Riverdale, MD 20737 Tel: (301) 734-8565
PPQ permits	http://www.aphis.usda.gov/permits/ppq_epermits.shtml

NOTICE

To use PPQ Permits you must have a user id and password provided by the USDA eAuthentication system. USDA agencies use USDA eAuthentication to enable customers to obtain accounts that will allow them to access USDA Web applications and services via the Internet.

The USDA eAuthentication system supports different levels of authentication. PPQ Permits currently requires all users to register for Level 2 eAuthentication.

C

Panicle Rice Mite

Appendix C

Forms

Contents

PPQ Form 391 Specimens for Determination

This report is authorized by law (7 U.S.C. 147a). While you are not required to respond your cooperation is needed to make an accurate record of plant pest conditions. *See reverse for additional OMB information.*

FORM APPROVED
OMB NO. 0579-0010

U.S. DEPARTMENT OF AGRICULTURE
ANIMAL AND PLANT HEALTH INSPECTION SERVICE

SPECIMENS FOR DETERMINATION

Instructions: Type or print information requested. Press hard and print legibly when handwritten. Item 1 - assign number for each collection beginning with year, followed by collector's initials and collector's number. Example (collector, John J. Dingle): 83-JJD-001.
Pest Data Section – Complete Items 14, 15 and 16 or 19 or 20 and 21 as applicable. Complete Items 17 and 18 if a trap was used.

FOR IIBIII USE
LOT NO.
PRIORITY

1. COLLECTION NUMBER

2. DATE — MO | DA | YR

3. SUBMITTING AGENCY
☐ State Cooperator ☐ PPQ ☐ Other _____

SENDER AND ORIGIN

4. NAME OF SENDER

6. ADDRESS OF SENDER

ZIP

INTERCEPTION SITE

5. TYPE OF PROPERTY *(Farm, Feedmill, Nursery, etc.)*

7. NAME AND ADDRESS OF PROPERTY OR OWNER

COUNTRY/ COUNTY

PURPOSE

8. REASON FOR IDENTIFICATION *("x" ALL Applicable Items)*

A. ☐ Biological Control (Target Pest Name)
B. ☐ Damaging Crops/Plants
C. ☐ Suspected Pest of Regulatory Concern *(Explain in* REMARKS*)*
D. ☐ Stored Product Pest
E. ☐ Livestock, Domestic Animal Pest
F. ☐ Possible Immigrant *(Explain in* REMARKS*)*
G. ☐ Survey *(Explain in* REMARKS*)*
H. ☐ Other *(Explain in* REMARKS*)*

9. IF PROMPT OR URGENT IDENTIFICATION IS REQUESTED, PLEASE PROVIDE A BRIEF EXPLANATION UNDER "REMARKS".

HOST DATA

10. HOST INFORMATION
NAME OF HOST *(Scientific name when possible)*

11. QUANTITY OF HOST
NUMBER OF ACRES/PLANTS
PLANTS AFFECTED *(Insert figure and indicate* ☐ Number ☐ Percent*):*

12. PLANT DISTRIBUTION
☐ LIMITED
☐ SCATTERED
☐ WIDESPREAD

13. PLANT PARTS AFFECTED
☐ Leaves, Upper Surface ☐ Leaves, Lower Surface ☐ Petiole ☐ Stem
☐ Trunk/Bark ☐ Branches ☐ Growing Tips ☐ Roots
☐ Bulbs, Tubers, Corms ☐ Buds ☐ Flowers ☐ Fruits or Nuts
☐ Seeds

PEST DATA

14. PEST DISTRIBUTION
☐ FEW
☐ COMMON
☐ ABUNDANT
☐ EXTREME

15. ☐ INSECTS ☐ NEMATODES ☐ MOLLUSKS

NUMBER SUBMITTED	LARVAE	PUPAE	ADULTS	CAST SKINS	EGGS	NYMPHS	JUVS.	CYSTS
ALIVE								
DEAD								

16. SAMPLING METHOD

17. TYPE OF TRAP AND LURE

18. TRAP NUMBER

19. PLANT PATHOLOGY – PLANT SYMPTOMS *("X" one and describe symptoms)*
☐ ISOLATED ☐ GENERAL

20. WEED DENSITY
☐ FEW ☐ SPOTTY ☐ GENERAL

21. WEED GROWTH STAGE
☐ SEEDLING ☐ VEGETATIVE ☐ FLOWERING/FRUITING ☐ MATURE

22. REMARKS

23. TENTATIVE DETERMINATION

24. DETERMINATION AND NOTES *(Not for Field Use)*

SIGNATURE

DATE

FOR IIBIII USE
DATE RECEIVED
NO.
LABEL
SORTED
PREPARED
DATE ACCEPTED
RR

PPQ FORM 391 *Previous editions are obsolete.*
(AUG 02)

This is a 6-Part form. Copies must be disseminated as follows:

Figure C-1 Example of PPQ Form 391 Specimens for Determination [side 1]

OMB Information
According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0579-0010. The time required to complete this information collection is estimated to average .25 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

Instructions
Use PPQ Form 391, Specimens for Determination, for domestic collections (warehouse inspections, local and individual collecting, special survey programs, export certification).

BLOCK	INSTRUCTIONS
1	1. Assign a number for each collection beginning the year, followed by the collector's initials and collector's number **EXAMPLE** In 2001, Brian K. Long collected his first specimen for determination of the year. His first collection number is 01-BLK-001 2. Enter the collection number
2	Enter date
3	Check block to indicate Agency submitting specimens for identification
4	Enter name of sender
5	Enter type of property specimen obtained from (farm, nursery, feedmill, etc.)
6	Enter address
7	Enter name and address of property owner
8A-8L	Check all appropriate blocks
9	Leave Blank
10	Enter scientific name of host, if possible
11	Enter quantity of host and plants affected
12	Check block to indicate distribution of plant
13	Check appropriate blocks to indicate plant parts affected
14	Check block to indicate pest distribution
15	• Check appropriate block to indicate type of specimen • Enter number specimens submitted under appropriate column
16	Enter sampling method
17	Enter type of trap and lure
18	Enter trap number
19	Enter X in block to indicate isolated or general plant symptoms
20	Enter X in appropriate block for weed density
21	Enter X in appropriate block for weed growth stage
22	Provide a brief explanation if Prompt or URGENT identification is requested
23	Enter a tentative determination if you made one
24	Leave blank

Distribution of PPQ Form 391
Distribute PPQ Form 391 as follows:
1. Send Original along with the sample to your Area Identifier.
2. Retain and file a copy for your records.

Figure C-1 Example of PPQ Form 391 Specimens for Determination [side 2]

PPQ Form 519, Compliance Agreement

Purpose of PPQ Form 519 Compliance Agreement

PPQ Form 519, Compliance Agreement is used to formalize agreements and to provide signed, written agreement of methods, conditions, and procedures necessary for compliance with regulations. PPQ Form 519 has a variety of uses in both domestic and foreign quaratine programs. PPQ Form 519 is also used to submit as evidence for violation cases.

According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control numbers for this information collection are 0579-0054, 0088, 0129, 0198, 0238, 0257, 0306, 0310. The time required to complete this information collection is estimated to average 1.25 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

FORM APPROVED OMB NUMBER 0579-0054/0088/0129/0198/0238/0257/0306/0310

UNITED STATES DEPARTMENT OF AGRICULTURE ANIMAL AND PLANT HEALTH INSPECTION SERVICE PLANT PROTECTION AND QUARANTINE	**COMPLIANCE AGREEMENT**
1. NAME AND MAILING ADDRESS OF PERSON OR FIRM	**2. LOCATION**

3. REGULATED ARTICLE(S)

4. APPLICABLE FEDERAL QUARANTINE(S) OR REGULATIONS

5. I / WE AGREE TO THE FOLLOWING:

6. SIGNATURE	**7. TITLE**	**8. DATE SIGNED**
The affixing of the signatures below will validate this agreement which shall remain in effect until canceled, but may be revised as necessary or revoked for noncompliance.		**9. AGREEMENT NO.**
		10. DATE OF AGREEMENT

11. PPQ/CBP OFFICIAL (NAME AND TITLE)	**12. ADDRESS**
13. SIGNATURE	
14. U.S. GOVERNMENT/STATE AGENCY OFFICIAL (NAME AND TITLE)	**15. ADDRESS**
16. SIGNATURE	

PPQ FORM 519 (MAY 2007) ***Previous editions are obsolete***

Figure C-2 Example of PPQ Form 519 Compliance Agreement

NOTICE

Review compliance agreements at least annually, but preferably twice a year. Amend compliance agreements as appropriate.

Any oral cancellation of a compliance agremeent must be confirmed in writing as soon as possible. The establishment has 10 days to appeal the cancellation. Appeals must be made to the PPQ Deputy Administrator.

Table C-1 Instructions to Complete PPQ Form 519, Compliance Agreement

Block	Instructions
1. Name and mailing address of person or firm	List the name and mailing address of the person or establishment with whom the agreement is being made
2. Location	List the location of the specific property(ies) for which the agreement is signed
3. Regulated article(s)	List the specific regulated articles to which the agreement applies, such as “cotton bales”
4. Applicable Federal quarantine(s) or regulations	List the legislative titles, parts, and subparts for the regulated articles, such as 7 CFR 353
5. I/we agree to the following	1. Outline the stipulations which apply to the establishment for each quarantine or regulation affecting the establishment 2. Make clear to the establishment that stipulations in the compliance agreement **do not** preclude compliance with other sections of a quarantine or regulation 3. If there is **not** enough space to list the stipulations, write “See attached sheets” (attach the sheets to the original PPQ Form 519 and all its copies)
6. Signature	Have the responsible official of the establishment sign
7. Title	List the responsible official’s title
8. Date signed	List the date the establishmnet official signed the agreement
9. Agreement number	Assign a compliance agreement number
10. Date of agreement	List the date of the agreement
11. PPQ/CBP official (name and title)	List the name and title of the PPQ/CBP official executing this agreement
12. Address	List the PPQ/CBP address
13. Signature	PPQ/CBP official signs
14.–16.	**Complete blocks 14 through 16 only when the State is involved in cooperating with enforcing Federal quarantines.**
14. U.S. governemnt/ State agency official	List the name and title of the State official
15. Address	List the State agency’s address
16. Signature	State Official signs

PPQ Form 523 Emergency Action Notification

FORM APPROVED - OMB NO. 0579-0102

U.S. DEPARTMENT OF AGRICULTURE
ANIMAL AND PLANT HEALTH INSPECTION SERVICE
PLANT PROTECTION AND QUARANTINE

EMERGENCY ACTION NOTIFICATION

SERIAL NO.

1. PPQ LOCATION | 2. DATE ISSUED

3. NAME AND QUANTITY OF ARTICLE(S)

4. LOCATION OF ARTICLES

5. DESTINATION OF ARTICLES

6. SHIPPER

7. NAME OF CARRIER

8. SHIPMENT ID NO.(S)

9. OWNER/CONSIGNEE OF ARTICLES

Name:

Address:

PHONE NO. | FAX NO.

SS NO. | TAX ID NO.

10. PORT OF LADING | 11. DATE OF ARRIVAL

12. ID OF PEST(S), NOXIOUS WEEDS, OR ARTICLE(S)

12a. PEST ID NO. | 12b. DATE INTERCEPTED

13. COUNTRY OF ORIGIN | 14. GROWER NO.

15. FOREIGN CERTIFICATE NO.

15a. PLACE ISSUED | 15b. DATE

Under Sections 411, 412, and 414 of the Plant Protection Act (7 USC 7711, 7712, and 7714) and Sections 10404 through 10407 of the Animal Health Protection Act (7 USC 8303 through 8306), you are hereby notified, as owner or agent of the owner of said carrier, premises, and/or articles, to apply remedial measures for the pest(s), noxious weeds, and or article(s) specified in Item 12, in a manner satisfactory to and under the supervision of an Agriculture Officer. Remedial measures shall be in accordance with the action specified in Item 16 and shall be completed within the time specified in Item 17.

AFTER RECEIPT OF THIS NOTIFICATION, ARTICLES AND/OR CARRIERS HEREIN DESIGNATED MUST NOT BE MOVED EXCEPT AS DIRECTED BY AN AGRICULTURE OFFICER. THE LOCAL OFFICER MAY BE CONTACTED AT:

16. ACTION REQUIRED

☐ TREATMENT:

☐ RE-EXPORTATION:

☐ DESTRUCTION:

☐ OTHER:

Should the owner or owner's agent fail to comply with this order within the time specified below, USDA is authorized to recover from the owner or agent cost of any care, handling, application of remedial measures, disposal, or other action incurred in connection with the remedial action, destruction, or removal.

17. AFTER RECEIPT OF THIS NOTIFICATION COMPLETE SPECIFIED ACTION WITHIN (Specify No. Hours or No. Days):

18. SIGNATURE OF OFFICER:

ACKNOWLEDGMENT OF RECEIPT OF EMERGENCY ACTION NOTIFICATION

I hereby acknowledge receipt of the foregoing notification.

SIGNATURE AND TITLE: | DATE AND TIME:

19. REVOCATION OF NOTIFICATION

ACTION TAKEN:

SIGNATURE OF OFFICER: | DATE:

PPQ FORM 523 (JULY 2002) Previous editions are obsolete.

Figure C-2 Example of PPQ Form 523, Emergency Action Notification

Table C-2 Instructions to Complete PPQ Form 523, Emergency Action Notification

Block	Instructions
1. PPQ location	List name and location of the nearest PPQ office
2. Date issued	List the date the notification was issued
3. Name and quantity of articles	List the host scientific name and cultivar
4. Location of articles	List the property address, greenhouse, or field number or name or other information indicating the location of the plant material being held
5. Destination of articles	List the eventual destination of the plant material being held
6. Shipper	List the plant material source, if known
7. – 8.	**Blocks 7 and 8 can be left blank unless the information is known**
7. Name of carrier	List the carrier's name
8. Shipment ID No.(s)	List the shipment's identification number
9. Owner/cosignee of article(s)	List the owner/cosignee of the article(s)
10. Port of lading	List the port of lading
11. Date of arrival	List the date of arrival
12. ID of pest(s), noxious weeds, or article(s)	To place plant material on a property on "hold," enter: "suspect Panicle Rice Mite, Steneotarsonemus spinki." NOTE: The authority under which actions are taken is The Plant Protection Act of 2000, Statute 7 USC 7701–7758.
12a. Pest ID no.	List the pest identification number
12b. Date intercepted	List the date the pest was intercepted
13. Country of origin	List the pest's country of origin
14. Grower no.	List the grower's number
15. Foreign certificate no.	List the foreign certificate's number
15a. Place issued	List the location from which the foreign certificate was issued
15b. Date	List the date on which the foreign certificate was issued
16. Action required	Suggested text: "All host plants of the Panicle Rice Mite, Steneotarsonemus spinki, (PRM) are prohibited from movement from the property pending further notification by USDA–APHIS–PPQ and/or State department of agriculture. No other host plant material, including harvested rice and blow out material, may leave the property until further evaluations can be made. After further investigations are conducted on the listed plants and other host material, if a positive detection is confirmed on the property, [plant material] will be treated/destroyed under supervison, with approved methods in accordance with USDA and State policies. Any additional hosts of PRM on the property are subject to Federal and State quarantine requirements prior to movement from the property."
17. After receipt of this notification, complete specified action within (specify no. hours or no. days)	List expected completion timeline of specified action
18. Signature of officer	PPQ Officer signs

D

Panicle Rice Mite

Appendix D

Images

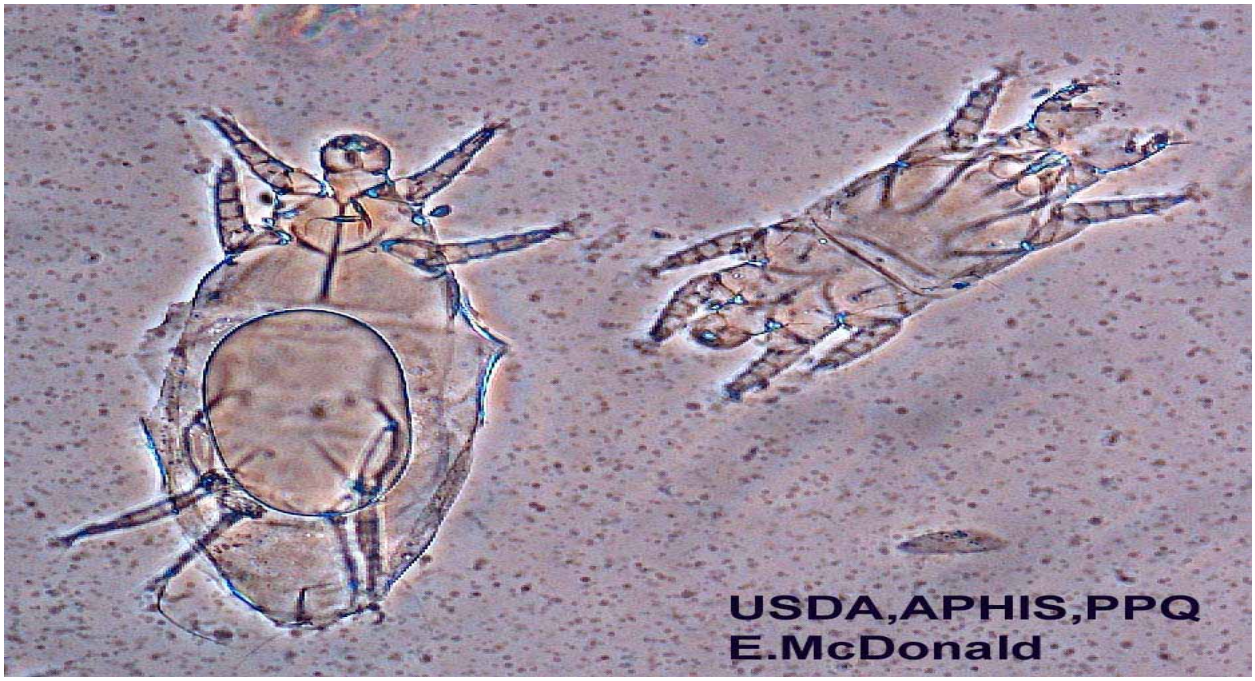

Figure D-1 Female and Male Panicle Rice Mite [Eric M. McDonald]

Figure D-2 Panicle Rice Mite Females and Eggs on Rice Leaf [Eric M. McDonald]

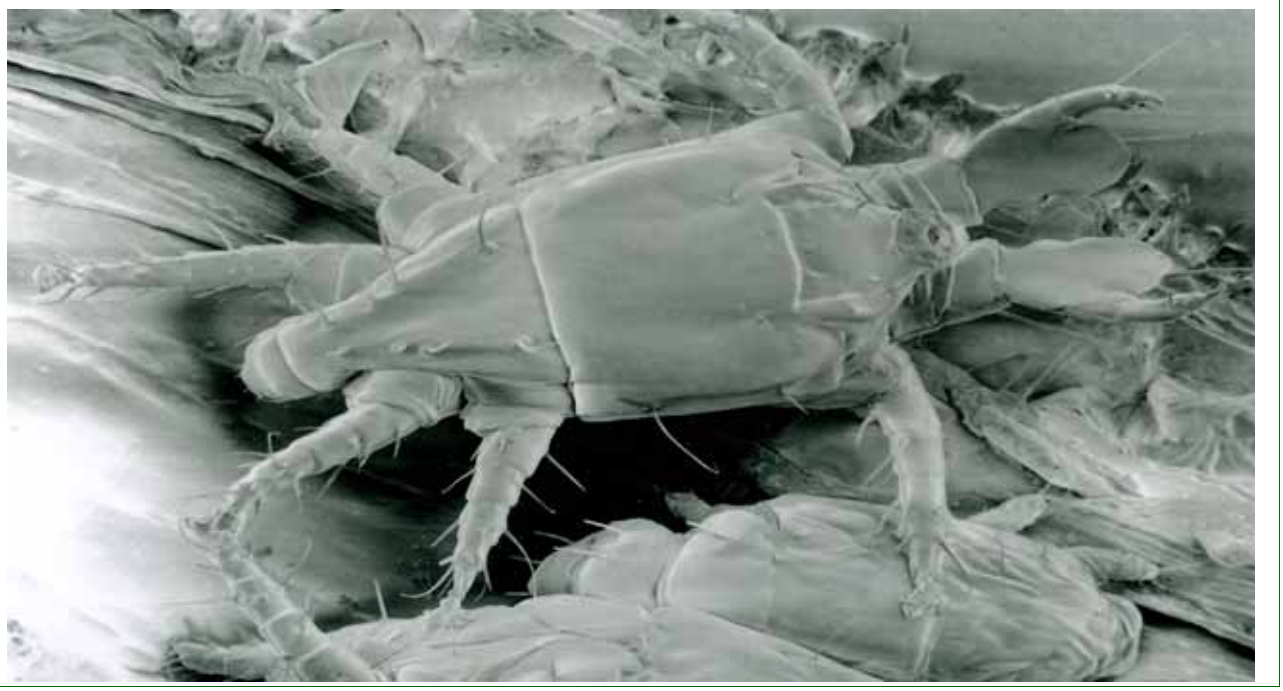

Figure D-3 Panicle Rice Mite Male [Ronald Ochoa, USDA–ARS–SEL]

E

Panicle Rice Mite

Appendix E

Protocols

Contents

Collection of Plant Tissue Samples

Important

Follow the sanitary precautions described in:

Sanitation on **page 3-2** and
Appropriate *Safeguarding* table for **where** PRM was detected

Step 1: Collect the Sample

Collect tillers with attached seeds. (The mite can be found under the seed panicle.) The entire plant above the water line should be sampled.

Table E-1 Timing of Sampling

If this location:	And:	Then survey when:
Fields in rice producing States	PRM was not previously confirmed in or near the field	The majority of rice plants within the field are at the heading to milk stage and see **Sample Timing** on **page 3-6**.
	Either: Fields were confirmed for PRM in 2009 Fields are in close proximity to positive 2009 fields	Rice plants are in the seedling stage and see **Sample Timing** on **page 3-6**.
Greenhouses	→	Funding has been made available and see **Timing** on **page 3-9**.

Read the following sections for specific information about collecting samples in fields and greenhouses:

Fields in Rice-Producing States on **page 3-5**

Greenhouses on **page 3-8**

Step 2: Prepare the sample

Layer the plant parts between dry paper towels, and then place in resealable plastic bags. Use a permanent marker to record the following information on the bag:

Collection information

Contact details

Identifying numbers

Step 3: Document the site

Mark the sampled area with flagging whenever possible and draw a map of the immediate area showing field locations so that the areas can be found in the future if necessary. Flagging or other markers in fields may help, but can become detached.

Be sure to accurately record GPS coordinates for each field or greenhouse location so that it may be resampled if necessary. For greenhouses, also note the following:

Approximate location on the bench [*ask the greenhouse personnel about specific methods used to denote location within a greenhouse, since these personnel will be the primary contacts in the event of positive samples being found*]

Bench number

Greenhouse number (or letter) designation

Step 4: Proceed to panicle rice mite extraction below

Panicle Rice Mite Extraction

Follow the sanitary precautions described in:

Sanitation on **page 3-2** and

Procedures to Prevent Cross-Contamination from *Panicle Rice Plant Wash Collection Procedure* (located at http://www.aphis.usda.gov/plant_health/plant_pest_info/rice_mite/index.shtml)

Use the protocol in this section to remove mites from rice plants collected from the field or greenhouse for later identification by qualified identifiers.

Supplies

The following materials will be needed:

- Exacto knife or razor
- Five-gallon bucket
- Latex gloves
- Pipette, hog-hair bristle brush, probe
- Quarantine/autoclave garbage receptacle
- Sink with spray attachmen
- Solution of 5% household bleach
- Spray bottles
- Squirt bottle filled with 70% ethyl alcohol
- Standard sieves
  - #10 to #24 (debris)
  - #60 (middle)
  - #400 (bottom)
- Tray for cutting plant material
- Tub
- Vials for storage and shipment
- Watch glass or Petri dishes

Procedure

Step 1: Receive the samples

Log-in the samples and take to the laboratory.

The rice panicle and leaf tissue will need to be cut off the stem and separated longitudinally into 3- to 4-inch segments. Place all cut tissue in a disinfected 5 gallon bucket. The bucket can be loosely filled to approximately halfway. Fill bucket approximately ½ full of water. Carefully mix the leaf and stem material with your hands for 1 to 2 minutes. Stack sieves in the sink, with the 400 on bottom, the 60 in the middle and the largest sieve on top to catch the large debris pieces. Pour the mixture, including the large pieces, into the top sieve. Allow the plant/water mixture to drain through the sieves and then spray hot water into the top sieve at medium pressure for 2 minutes.

After the water has gone through the sieves, collect the debris from the bottom sieve using 70% ethanol squirt bottle. Rinse the debris to the bottom of one side then backwash the sieve to dislodge any mites that might be attached to the # 400 sieve. Rinse all debris into a Petri dish or watch glass with the 70% ethanol. Approximately half of the mites will float in the surface film of the 70% alcohol. Mites should be transferred to a vial for later identification.

Preservation, Screening, and Shipment

Follow the instructions in this section when preserving, screening and shipping samples of suspect mites for identification.

1. Follow the instructions in *Panicle Rice Mite Plant Wash Collection Procedure* to extract mites from plant samples. The procedure is also referred to as washing.

Address http://www.aphis.usda.gov/plant_health/plant_pest_info/rice_mite/index.shtml

2. Remove all plant material remaining in the sample.

3. Preserve the mite specimens as follows:

If mite screening and identifier capability in a State is:	Then:	And:
Available	Screen the extracted samples to isolate *Steneotarsonemus* spp.	Mount *Steneotarsonemus* specimens on slides (prefered) or place in 70% ethyl alcohol in a vial and tightly seal.
Unavailable	→	Place all mites extracted in 70% ethyl alcohol in a vial and tightly seal.

4. Complete **PPQ Form 391 Specimens for Determination** on **page C-2**.
5. Send completed PPQ Form 391 and specimens to Eric McDonald.

Address

Eric M. McDonald
USDA–APHIS–PPQ
Plant Inspection Facility
19581 Lee Road
Humble, TX 77338
Tel: 281-230-7204
Fax: 281-230-7203

Communication of Determination

States with No Previous Positive Confirmations for PRM

The authorized identifier, Eric McDonald, has identification authority for PRM,. If a positive ID is made from a State that has no previous determinations of PRM, he will have the information from the PPQ form 391 entered in the Pest ID database and send specimens to the USDA Systematic Entomology Laboratory (SEL) in Beltsville, MD. (These will be routed to Dr. Ronald Ochoa, the national mite identification specialist for final confirmation).

The address for sending suspect PRM for SEL confirmation is:

Location Leader
Systematic Entomology Laboratory
Attn: Communication and Taxonomic
Services Unit
Building 005, Room 137, BARC–West
10300 Baltimore Avenue

Beltsville, MD 20705
Phone: 301-504-7041 (for Fedex ONLY, do not call SEL for status of samples. Call NIS at 301-734-5312.

Also, send an email a notification with the following text in the subject line: SUSPECT FWD: S. spinki (PRM) in XX (State two letter abbreviation) to the following email address:

ppq.nis.urgents@aphis.usda.gov

The PPQ National Identification Staff (NIS) in Riverdale, MD will notify PPQ Emergency and Domestic Programs (EDP) who will forward it to program managers, SPHD's and SPRO's from the State of origin.

Once a final determination is received from SEL, the same notification procedure as above will be followed to communicate the results.

States with New Positive Confirmations for PRM

Any positive sample from a new State processing their own samples should send suspect positives to Eric McDonald, who will also forward them for verification by the SEL in Beltsville, MD.

The authorized identifiers at the above locations have identification authority for S. spinki, and if a positive ID is made from a State that is already positive for S. spinki, they will email a PDF file of the final determination record from PestID to the following email address:

ppq.nis.urgents@aphis.usda.gov

The PPQ National Identification Staff (NIS) in Riverdale, MD will forward it to PPQ Emergency and Domestic Programs (EDP) who will forward it to program managers, SPHD's and SPRO's from the State of origin.

Negative determinations can be communicated directly back to the State of origin by the authorized identifier without notifying NIS.

Table E-2 Communication of Determination of Panicle Rice Mite

If States have:	Then:	And send to:
Previously confirmed detections of PRM	1.Eric McDonald will make determinations and communicate non-quarantine mite species to the submitting State, and any *Steneotarsonemus* spp. reported to; 2.National Identification Service (NIS) who will notify; 3.Emergency and Domestic Programs (EDP) to forward the determinations to the national and region program managers, SPHD and SPRO. 4.The SPHD or SPRO should be responsible for communicating these determinations back to the originating laboratory or identifier.	Eric M. McDonald USDA–APHIS–PPQ Plant Inspection Facility 19581 Lee Road Humble, TX 77338 Tel: 281-230-7204 Fax: 281-230-7203
No previous detections of PRM	1. Eric McDonald will make determinations and communicate non-quarantine mite species back to the submitting State. 2. If suspect Steneotarsonemus spp. or S. spinki is identified, Eric McDonald will forward to SEL specialist to make final determination, who notifies NIS. 3. NIS will notify EDP who notifies the national/ regional program manager, SPHD, and SPRO. 4. The SPHD or SPRO should be responsible for communicating the determination back to the originating laboratory or identifier.	Dr. Ronald Ochoa Systematic Entomology Laboratory Room 008 10300 Baltimore Avenue Bldg. 005 BARC-West Beltsville, MD 20705-0000 email: ron.ochoa@ars.usda.gov Telephone: 301-504-7890 Fax: 301-504-6482

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Panicle Rice Mite

Appendix F

Integrated Survey Information System

Use the Integrated Survey Information System (ISIS) as the centralized database for panicle rice mite (*Steneotarsonemus spinki* Smiley) (PRM) survey data. For specific directions, contact ISIS Customer Support.

Address

ISIS Customer Support
Eastern Region
Telephone: 919-855-7754
Western Region
Telephone: 970-494-7557

Data collected during surveys should include the following:

- Address including county and State
- Any other relevant information
- Collector's name and affiliation
- Date of collection
- Full name of business, institution, or agency
- GPS coordinates of host plant and property
- Grower's field or greenhouse identification numbers if appropriate
- Positive or negative results from testing
- Sample number
- Species and cultivar of host plant
- Type of property (i.e., commercial field, research field, greenhouse)

Data collection can be simplified by the use of preprogrammed hand-held units that allow ease of data recording with GPS capability. A system of data collection should include an efficient tracking system for suspect samples such that their status is known at various stages and laboratories in the confirmation process.

Glossary

Introduction

Use this glossary to find the meaning of specialized words, abbreviations, acronyms, and terms used by USDA–APHIS–PPQ–EDP. To locate where in the manual a given definition, term, or abbreviation is mentioned, refer to the Index.

Definitions, Terms, and Abbreviations

ANSI. American National Standards Institute
APHIS. Animal and Plant Health Inspection Service
ARS. Agricultural Research Service
CPHST. Center for Plant Health Science and Technology
cold treatment. exposure of a host product to cold temperatures lethal to a target pest; can be used alone or with fumigants
confirmed detection. positive identification by a recognized expert
containment. application of phytosanitary measures in and around an infested area to prevent spread of a pest
control. suppression, containment or eradication of a pest population
delimiting survey. determination of the extent of an infestation in an area where an exotic species has been detected
detection. collection of any life stage of an exotic species
detection survey. survey conducted over a large area to discover new infestations in areas where the pest is not known to occur
EAN. Emergency Action Notification
EC. Environmental Compliance
ECT. Environmental Compliance Team
EDP. Emergency and Domestic Programs
EIS. environmental impact statements
EPA. Environmental Protection Agency
eradication. application of phytosanitary measures to eliminate a pest from an area
ES. Environmental Services
ESA. Endangered Species Act
evaluation survey (*see also monitoring survey)*. conducting visual or trapping

surveys in an area that has been treated with insecticide to evaluate the effectiveness of the treatment
FIFRA. Federal Insecticide, Fungicide, and Rodenticide Act
fumigation. application of an approved insecticidal chemical that enters the target pest's tracheal system in volatile form
generation. offspring of a parent population that move through the life cycle together
GPS. global positioning system
host. species that provides food, shelter, or reproductive requirements for another organism
identification authority. authority to confirm the presence of a particular pest organism issued by the APHIS–National Identification Services to diagnosticians that have demonstrated proficiency in identifying
incident command system. system to manage emergencies, based on the USDA–Forest Service forest fire management system
invasive species. organism or pest species not native to or historically resident in North America
ISIS. Integrated Survey Information System
monitoring survey *(see also evaluation survey).* conducting visual or trapping surveys in an area that has been treated with insecticide to evaluate the effectiveness of the treatment
MOU. memorandum of understanding
NEPA. National Environmental Policy Act
NIS. National Identification Services
PASS. potentially actionable suspect sample (*see* definition below)
pathogen. any organism that can incite a disease
potentially actionable suspect sample (PASS). suspect positive sample diagnosed or identified by provisionally approved laboratory or diagnostician with identification authority that would require confirmatory testing by an official APHIS laboratory due to the nature of the plant sampled and the necessity for Federal confirmation
PPD. Policy and Program Development
PPQ. Plant Protection and Quarantine
PRM. panicle rice mite (*Steneotarsonemus spinki* Smiley)
ratoon cropping. multiple cropping where the second or later crops are the result of regrowth of the first crop
regulated articles. all known or suspected hosts of a confirmed infestation of an exotic species, including soil and any other suspected product or article
RTMV. rice tarsonemid mite virus
SEL. Systematic Entomology Laboratory
SPHD. State Plant Health Director
SPRO. State Plant Regulatory Official
suspect positive. such a result may require confirmatory testing if the sample is a PASS sample
symptom. external and internal reactions or alterations of a plant as the result

of a pest, pathogen, environmental effect or injury

targeted survey (also known as a **hot zone**). choosing an area, usually residential, to concentrate surveys based on known pathway information with ZIP code-based demographic information or other scientifically based information

traceback. investigation of the origin of infested plants from initial detection location back through intermediate steps in commercial distribution channels to the origin

trace forward. investigation to determine where infected plants may have been distributed from a known infestation through steps in commercial distribution channels or wholesale or retail procurement

TQAU. Treatment Quality Assurance Unit

USDA. United States Department of Agriculture

Panicle Rice Mite

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