

Distribution of Rusty Tussock, *Orgyia antiqua* on Fraser Valley Cranberry Farms

BC Cranberry Marketing Commission

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Executive Summary

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Rusty tussock is an occasional pest of cranberries that has previously been localized to only a few fields in North Richmond and Delta, BC. However, in 2012 we found new infestations in Pitt Meadows, Langley and South Richmond. The overall goal of this study was to determine if the status of rusty tussock has changed for Fraser Valley cranberries. Twelve fields with no prior history of rusty tussock were surveyed via sweep sampling during July 2013. No rusty tussock larvae were found during these sweeps. Two new detection for rusty tussock were made in 2013, however both of these occurred during regular visual monitoring for blackheaded fireworm. Finally, rusty tussock were detected in two of the six fields with a previous history. No larvae were found in the surrounding vegetation of fields where rusty tussock was detected. Our findings suggest that growers should be aware that the distribution of rusty tussock is no longer localized to Delta and North Richmond. However, the status of rusty tussock has not changed - it continues to be an occasional pest that can be effectively detected during visual sampling for other caterpillar pests.

Introduction and Objectives

Rusty tussock (*Orgyia antiqua*) is an occasional pest of cranberries that has the potential to cause serious economic damage. It has a wide host range that includes both conifers and deciduous species. On trees and shrubs rusty tussock feeds primarily on leaves or needles, however on cranberries rusty tussock larvae also feed on flower buds (Anon. 2011). Because of the wide host range, new infestations likely start as larvae blow in (via silken threads) to cranberry fields from surrounding forested areas. Females do not fly, but produce a pheromone that is highly attractive to males (LeDuc and Turcotte 2004). Once established within a cranberry field, there is the potential for populations to build - i.e. females become residents of the cranberry field and continue to "call" mates in from both the cranberry field and surrounding forested areas. Within a cranberry field rusty tussock feeding damage is usually patchy rather than throughout the entire field. Rusty tussock patches are most apparent during bloom when they appear darker in colour than surrounding foliage and have fewer blossoms.

Rusty tussock larvae have a distinctive appearance compared to other caterpillars found in cranberries. The larvae have furry patches on their head as well as a yellow or orange tufts along their black bodies (Maurice *et al.* 2000) (Fig. 1). These larvae can be detected during regular visual monitoring for the key pest of cranberries in BC - blackheaded fireworm (*Rhopobota naevana*) (see Maurice *et al.* 2000). In fields with a previous history of rusty tussock moth or where larvae have been observed during regular fireworm monitoring additional sampling using a sweep net is done. Sweep net sampling for rusty tussock is done during the day and is concentrated in areas with a previous history of rusty tussock infestation, for example if larvae have been detected along the East edge of a field we will focus our sampling there. As well, areas with low blossoms or where larvae have been detected during visual sampling will also be swept. By targeting sweep sampling to areas where larvae are likely to be found the damage to blossoms

by the sweep net is minimized. To our knowledge most BC growers treat for rusty tussock upon detection. In other regions, the threshold for gypsy moth and related species (like rusty tussock) is 4.5 larvae/sweep sample (LeDuc and Turcotte 2004). Growers do spot treatment for rusty tussock moth to minimize insecticide inputs during bloom.

In previous years, rusty tussock infestations in cranberries have been concentrated to a few fields in Richmond (ESC unpublished data) and Delta (Maurice et al. 2012). In 2012, the number of ESC client fields with rusty tussock increased from three fields within the same region (Richland) to six fields in four different regions (North Richmond, Pitt Meadows, East Langley and South Richmond - Sidaway). The concern is that the distribution of rusty tussock, and possibly its status as an occasional pest, has changed.



Figure 1. Rusty tussock larva, with distinct colouring and tufts of hair. Photo credit: USDA Forest Service Archives, USDA Forest Service, www.forestryimages.org

The objectives of this study were to

- 1) determine the current distribution of Rusty Tussock in cranberry fields in the Fraser Valley
- 2) determine factors associated with Rusty Tussock infestation and
- 3) increase grower/ pest manager awareness about Rusty Tussock- appearance, monitoring, and potential damage.

Materials & Methods

Objective 1: Determine the current distribution of Rusty Tussock in cranberry fields in the Fraser Valley

Twelve cranberry fields distributed throughout the Fraser Valley (Richmond, Delta, Langley, Pitt Meadows and Chilliwack) with no previous history of rusty tussock were chosen as field sites (Table 1). These 12 fields were chosen because their surrounding vegetation (woods, trees, annual weeds and grasses) were potential habitats for rusty tussock and/or they were close to

fields previous detections. These sites were visited every seven to ten days over the course of bloom for a total of four visits per farm (Table 2). During each visit, sweep samples were taken along two of the edges and a single inner pass. Edges closest to infested fields or other rusty tussock habitat were chosen. A sweep sample consisted of six sweeps (dragging the sweep net along the top of the cranberry foliage in a 180° arc) between two sprinklers. We spaced sweeps along the edges and an inner pass based on the length of the field, with the goal of at least 10 sweeps for each edge and inner pass.

Table 1. Summary of field sites chosen for rusty tussock survey

Field	Coordinates of Field	Field	Coordinates of Field
North Richmond 1	49°11'08.85" N 123°03'11.99" W	North Langley	49°12'20.94" N 122°36'39.19" W
North Richmond 2	49°11'08.85" N 123°02'52.80" W	East Langley 1	49°09'22.76" N 122°29'41.58" W
South Richmond	49°09'52.29" N 123°04'39.49" W	East Langley 2	49°09'55.23" N 122°28'59.05" W
West Delta	49°07'17.63" N 123°02'22.93" W	Maple Ridge	49°15'16.89" N 122°36'07.99" W
East Delta	49°05'09.02" N 122°57'01.29" W	Abbotsford	49°09'22.98" N 122°26'03.83" W
West Surrey	49°05'30.35" N 122°48'31.71" W	Chilliwack	49°09'23.92" N 121°50'59.12" W

Table 2. Sampling dates for 12 fields selected for rusty tussock survey

Field Site	Sweep # 1	Sweep # 2	Sweep # 3	Sweep # 4
North Richmond 1	July 1 2013	July 8 2013	July 15 2013	July 22 2013
North Richmond 2	July 1 2013	July 8 2013	July 15 2013	July 22 2013
South Richmond	July 1 2013	July 8 2013	July 15 2013	July 22 2013
West Delta	June 17 2013	July 1 2013	July 8 2013	July 15 2013
East Delta	June 17 2013	July 1 2013	July 8 2013	July 15 2013
West Surrey	July 1 2013	July 8 2013	July 15 2013	July 22 2013
North Langley	June 21 2013	July 4 2013	July 11 2013	July 18 2013
East Langley 1	June 21 2013	July 3 2013	July 10 2013	July 17 2013
East Langley 2	June 21 2013	July 3 2013	July 10 2013	July 17 2013

Maple Ridge	June 18 2013	July 2 2013	July 9 2013	July 16 2013
Abbotsford	June 21 2013	July 3 2013	July 10 2013	July 17 2013
Chilliwack	June 21 2013	June 28 2013	July 5 2013	July 12 2013

Objective 2: Determine factors associated with Rusty Tussock infestation e.g. variety, proximity to woods, source of vines, age of fields.

We examined the surrounding vegetation and other characteristics of 20 fields (8 with a known prior history of rusty tussock and the 12 survey fields (see Table 1 above)). For each site, the surrounding vegetation, variety, distance away from rusty tussock positive fields, and pest presence or absence was recorded. When rusty tussock were observed in fields over the course of the 2013 field season, we did a cursory (30 minutes or less depending on the amount of vegetation) visual survey of the surrounding vegetation for rusty tussock larvae. Sweep samples were not conducted in surrounding vegetation.

Objective 3: Increase grower/ pest manager awareness about Rusty Tussock- appearance, monitoring, and potential damage

We participated in the Cranberry Field Day in August 2013 in Langley, BC. We prepared a poster focusing on visual and sweep sampling. Our staff were on hand with sweep nets to demonstrate sweeping and we had rusty tussock larvae available for observation. Poster handout submitted with report.

Results & Discussion

We did not find any larvae in any of our twelve sampling sites (with no previous history of Rusty Tussock) (Table 3). However, during regular monitoring we found rusty tussock larvae on two farms with no prior detections: Delta (1 larva) and Abbotsford (1 larva). No additional larvae were found during follow up sweep sampling in these fields (Table 4). Sweep sampling detected larvae in two of the six fields with a previous history of rusty tussock (Table 4). During visual observations, of surrounding vegetation in fields where rusty tussock larvae were detected, we did not find rusty tussock. In the fields with detections in 2013 or in previous years, there was no pattern to suggest that any particular type of vegetation or other field characteristic (e.g. variety) makes a cranberry field more at risk of rusty tussock infestation. Most likely the established infestation in North Richmond 2 (Table 4) is a resident population. In contrast, the newer infestation in East Langley (Table 4) may be a combination of residents (from 2012 population) and newly blown in.

The findings of this survey confirm that the distribution of rusty tussock has changed. Growers should be aware that new infestations continue to be detected outside of the previously described areas of Richmond and Delta. However, this pest continues to be an occasional pest and growers can continue to rely on visual sampling for detection of rusty tussock infestations in fields. Sweep sampling is only necessary if larvae are detected visually. A specific sweep sampling program for rusty tussock, in fields with no prior history does not appear to be necessary. A caveat to our findings however is that all of our sweep sampling was done during the day. Maurice *et al.* (2000) recommend timing sweep sampling for rusty tussock in the evening. As a follow up, in 2014 we plan to do targeted evening sweeps for rusty tussock in client fields to further confirm that we aren't overlooking this pest during regular crop monitoring.

Table 3. Summary of surrounding vegetation, variety and proximity to rusty tussock positive fields in survey fields for 2013.

Region/Site	Surrounding Vegetation	Cranberry Variety	KM away from RT positive fields	Rusty Tussock found?
North Richmond 1	Commercial Cranberries + Weeds & Grasses	Stevens	2 km	0
North Richmond 2	Commercial Cranberries + Weeds & Grasses	Stevens	2 km	0
South Richmond	Commercial Cranberries + Blueberries + Weeds & Grasses	Mullica	0.5 km	0
West Delta	Commercial Cranberries, Grass Dykes, Deciduous Trees	Stevens	0.5 km (new field on same farm)	0
East Delta	Commercial Cranberries, Mixture of Coniferous and Deciduous Trees, Potatoes	Stevens	7 km	0
West Surrey	Commercial Cranberries, Grassy Dykes, Deciduous Trees & Blueberries	Stevens	21 km	0
North Langley	Commercial Cranberries, Grassy Dykes, & Trees	Stevens	15 km	0
East Langley 1	Commercial Cranberries, Wooded area with Deciduous and Coniferous Trees	Crimson, Mullica	0.2 km (beside RT positive farm)	0

East Langley 2	Commercial Cranberries, Deciduous Trees, Weeds and Grasses	Stevens	1.7 km	0
Maple Ridge	Commercial Cranberries	Stevens	9 km	0
Abbotsford	Commercial Cranberries, Deciduous Trees, Weeds & Grasses	Stevens	1.5 km	0
Chilliwack	Commercial Cranberries, Corn,	Stevens	59 km	0

Table 4. Rusty tussock activity (2013) and surrounding vegetation for cranberry fields with previous rusty tussock History

Region	Surrounding Vegetation	First Detection	# Of Larvae Observed in 2013	Variety
Pitt Meadows	Commercial Cranberries, Corn, Annual Weeds & Grasses	2012	0	Stevens
North Richmond 1	Commercial Cranberries	2010	0	Bergman, Stevens
North Richmond 2	Commercial Cranberries	2010	5 Larvae	Bergman
North Richmond 3	Commercial Cranberries	2004	0	Bergman, Grylisky, Pilgrim, Ben Lear
South Richmond	Commercial Cranberries, Blueberries, Wooded Area, Mixture of Deciduous and Coniferous Trees	2012	0	Mullica
West Delta	Commercial Cranberries, Deciduous Trees, Annual Weeds & Grasses	2013	1	Stevens
East Langley	Commercial Cranberries, Wooded Area, Coniferous and Deciduous Trees	2012	5+ Larvae	Stevens

Abbotsford	Commercial Cranberries, Deciduous Trees, Annual Weeds & Grasses	2013	1	Pilgrim/Stevens
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Literature Cited

Anonymous. 2011. Rusty Tussock Moth. Forest Invasive Alien Species. <http://www.exoticpests.gc.ca/es-details/insect/1000089>. First Accessed February 20, 2013.

Le Duc, I. and C. Turcotte. 2004. Eastern Canada Cranberry IPM Manual. 142 pp.

Maurice, C., C. Bedard, S.M. Fitzpatrick, J. Troubridge, and D. Henderson. 2000. Integrated Pest Management for Cranberries in Western Canada. 81pp.

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