

## SCIENTIFIC NOTE

## Infestation of Bent Grass by a New Seed Pest, *Chirothrips manicatus* (Thysanoptera: Thripidae), in Oregon

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Bent grasses (*Agrostis* spp.) (Poaceae: Pooideae) are used extensively on golf courses. Oregon is the largest bent grass seed producing state in the U.S.A., with over 3,900 ha under cultivation of *Agrostis stolonifera* L. (= *Agrostis palustris* Hudson) (creeping bent grass), *Agrostis castellana* Boissier & Reuter (dryland or Highland bent grass) and *Agrostis capillaris* L. (= *Agrostis tenuis* Sibthorp) (colonial bent grass) (USDA-ODA 2002).

In June 2004 *Chirothrips manicatus* Haliday (Thysanoptera: Thripidae) were detected within individual florets of *Agrostis* spp. in Oregon. Voucher specimens were deposited in the Oregon State Entomology Museum, Corvallis, OR. Each floret with a thrips produced no seed.

*Chirothrips manicatus* is widespread in North America. In Oregon it has been collected from flowers of various plants (Post 1947), but this is the first report of it developing in florets of *Agrostis*. It has been reported on *A. tenuis* in New Zealand (Mound and Walker 1982) and on *Agrostis* sp. in Europe (zur Strassen 2003), but there is no information on its impact on seed production on these hosts. It is reported as a pest of orchard grass in New Zealand (Doull 1956).

To determine the extent to which *C. manicatus* was present in commercial *Agrostis* seed production fields in Oregon, we surveyed 13 bent grass seed production fields in July 2004 (Table 1). The fields were located in the Silverton Hills area in

**Table 1.**

Incidence of *Chirothrips manicatus* in *Agrostis* seed production fields in the Willamette Valley in western Oregon. Means  $\pm$  SE are based on collections of 17 to 50 panicles from each of four transects in a diamond pattern in each field.

Field	<i>Agrostis</i> host	Cultivar	Mean % panicles with thrips	Mean no. thrips per panicle	Mean no. seeds per panicle	Mean % seed loss due to thrips
1	<i>A. castellana</i>	Highland	87.9 $\pm$ 4.1	22.6 $\pm$ 2.1	452 $\pm$ 105	5.1 $\pm$ 1.4
2	<i>A. castellana</i>	Highland	49.8 $\pm$ 7.3	6.8 $\pm$ 0.9	426 $\pm$ 53	0.9 $\pm$ 0.2
3	<i>A. castellana</i>	Highland	60.0 $\pm$ 5.7	10.3 $\pm$ 1.5	526 $\pm$ 55	1.1 $\pm$ 0.4
4	<i>A. castellana</i>	Highland	26.2 $\pm$ 5.4	5.4 $\pm$ 2.5	233 $\pm$ 20	1.3 $\pm$ 0.7
5	<i>A. castellana</i>	Highland	80.5 $\pm$ 7.1	17.9 $\pm$ 2.3	375 $\pm$ 11	4.1 $\pm$ 1.8
6	<i>A. castellana</i>	Highland	32.9 $\pm$ 4.3	12.5 $\pm$ 3.2	471 $\pm$ 10	1.0 $\pm$ 0.4
7	<i>A. castellana</i>	Highland	64.8 $\pm$ 10.1	17.6 $\pm$ 2.0	467 $\pm$ 9	2.8 $\pm$ 0.5
8	<i>A. castellana</i>	Highland	38.0 $\pm$ 7.8	6.0 $\pm$ 0.7	277 $\pm$ 22	0.8 $\pm$ 0.3
9	<i>A. stolonifera</i>	Crenshaw	2.0 $\pm$ 1.4	4.8 $\pm$ 2.5	528 $\pm$ 44	0.02 $\pm$ 0.01
10	<i>A. stolonifera</i>	Princeville	9.5 $\pm$ 3.1	1.4 $\pm$ 0.1	452 $\pm$ 22	0.03 $\pm$ 0.01
11	<i>A. stolonifera</i>	Pennlinks	0	0	321 $\pm$ 11	0
12	<i>A. stolonifera</i>	Penncross	0	0	292 $\pm$ 12	0
13	<i>A. capillaris</i>	Alistar	0.5 $\pm$ 0.5	0.03 <sup>1</sup>	425 $\pm$ 13	0.01 $\pm$ 0.01

<sup>1</sup> Five individuals in a single panicle

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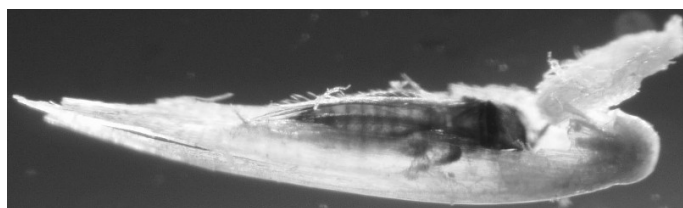
the Willamette Valley in western Oregon. In each field, 17 to 50 panicles were collected at random along each of four transects in a diamond pattern. Panicles were examined under a stereo microscope and the number of thrips recorded (Table 1). Seeds from each panicle were threshed by hand to avoid seed loss. Caryopses were separated from the lemma and palea using a scarifier (Model PSS1000, Mater International, Inc., Corvallis, OR) and debris was removed with an air column (Alderman *et al.* 2003). Total seed weight from each transect was determined and the weight of a subset of 200 seeds from each transect was used to estimate the total number of healthy seeds in panicles collected from each transect. Percentage seed loss was estimated as: [number of infested seeds / (number of infested seeds + estimated number of healthy seeds)] x 100, where the number of infested seeds equals the number of thrips, based on our observation of one thrips per floret and destruction of a single seed by each thrips.

Overall, 32.5% of 2,310 panicles from the 13 fields that were examined were infested with thrips and the abundance of the thrips appeared to be linked to the host (Table 1). The greatest infestation was observed in Highland bent grass (*A. castellanana*) which is the most common cultivar

grown for seed in Oregon. Individual bent grass florets contained a single *C. manicatus* pupa or adult (apterous male or winged female) with its head towards the base of the floret (Figure 1). The thrips were enclosed firmly between the lemma and the palea, and were not easily dislodged. In florets where a thrips was present, organic debris was visible but there was no trace of the caryopsis (seed). These data negate previous speculation that small seeded plants such as *Agrostis* spp. are unlikely hosts for *C. manicatus* (Doull 1956).

It is not known how long *C. manicatus* has been present on *Agrostis* in Oregon. As there is no external indication of *C. manicatus*, it is possible that its presence could have been undetected. Female *C. manicatus* overwinter within florets in the field (Doull 1956) and therefore it is also possible that *C. manicatus* has emerged as a pest due to the phase-out of field burning in the late 1980's.

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**Figure 1.** *Chirothrips manicatus* within a floret of *Agrostis castellanana*.

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