POTATO TUBERWORM SURVEY IN OREGON, 2005

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Background

The potato tuberworm (PT), *Phthorimaea operculella* Zeller (Lepidoptera, Gelechiidae) is believed to have originated in South America and can adapt to a wide variety of climatic conditions. It has spread to many tropical and subtropical countries in the Americas, Asia and Africa, to Australia, New Zealand and Europe. In the US, PT is recorded from at least 25 States from coast to coast. PT prefers potato but can also attack other species of Solanaceae such as tobacco, tomato and nightshade.

Tuberworm caterpillars are about 1⁄2 inch long when full grown, have a pale body with a dark brown to black head. Adult moths are narrow, about 1⁄4 inch long, light brown, with various darker spots on the wings. The life cycle is 3-5 days for egg development, 9-10 for the four larval instars and 11-13 days for the pupal stage at 77°F (25°C). The adult life span ranges from 9-25 days with up to 5-6 generations per year. The PT has at least 2–3 generations per year in Oregon based upon OSU's weekly trapping data (http://oregonstate.edu/Dept/hermiston/ extension/ARarchive.htm). First flight is in early spring peaking in March and April. The second flight period is June to September. The protracted summer flight period suggests two overlapping generations. The PT female oviposits between 50-100 eggs. Eggs may be deposited on the foliage or the potato tuber. The first instar larvae cause damage as leaf miners and later, bore into the stems and then tubers. The larva may pupate inside the tuber, on the surface of the tuber, or in the soil. Larvae and/or pupae can enter potato storage areas inside infested tubers.

Trapping

PT has been known from the PNW since at least 1965, but has only recently become a pest issue. In Oregon, PT was first identified in the Columbia Basin area around Hermiston in 2002 by OSU. In the 2004 season, OSU Extension placed 35 pheromone traps catching several thousand specimens in Umatilla County. ODA decided to conduct a statewide survey in 2005 for PT to determine its distribution in Oregon. We placed either wing or diamond-shaped sticky traps, baited with PT lure, in the margins of potato fields in all potato growing areas in the state. Traps were hung no higher than 12" above the plant canopy or 12" off bare ground using 4 foot long, metal, Japanese beetle trap stakes. Most traps were in the field from mid July through early November. Lures were changed once and traps were checked biweekly during the season. Traps or inserts were changed if dirty or damaged.

In 2005, ODA placed one PT trap at each of 53 sites in potato growing areas of Baker (6 traps), Clackamas (1), Jefferson (4), Klamath (12), Linn (1), Malheur (14), Marion (1), Multnomah (4), Union (7) and Washington (3) counties. A total of 89 moths from 15 positive trap sites were detected and confirmed in Baker (3 moths), Klamath (27), Malheur (1), Multnomah (25), Union (30) and Washington (3) counties. Seven positive sites detected only one moth each. The highest number

trapped was 22 moths at a Union Co. site. OSU continued their monitoring program in 2005 and found PT in four additional counties: Crook, Jefferson, Morrow, and Umatilla (pers. comm. w/ Phil Hamm, Lynn Jensen, and Steve James). To date, PT positive counties in Oregon include Baker, Crook, Jefferson, Klamath, Malheur, Morrow, Multnomah, Umatilla, Union, and Washington (Fig.1).

Suspect PT specimens were all examined and confirmed by ODA's Entomology Laboratory in Salem. External characters are usually sufficient for ID. Adults have a series of spots on the forewings and three contrasting stripes on the thorax (Fig. 2). The apex of the male abdomen has short, erect yellow scales dorsally and long, lateral scale tufts (Fig.3). The internal male genitalia (Fig.4) are also distinctively different from those of other species.

ODA plans to survey statewide again in 2006 to confirm overwintering in positive counties, for any additional potato growing areas, and areas that were not positive in 2005. A possible biological control program is being explored. Several parasitoid wasps and a granulosis virus are known to attack PT and could provide biocontrol.

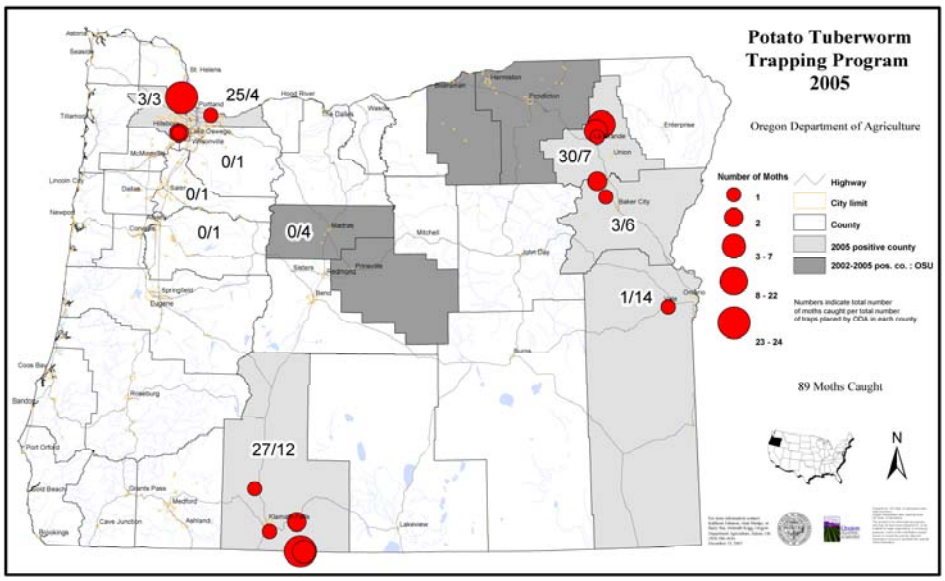

Figure 1

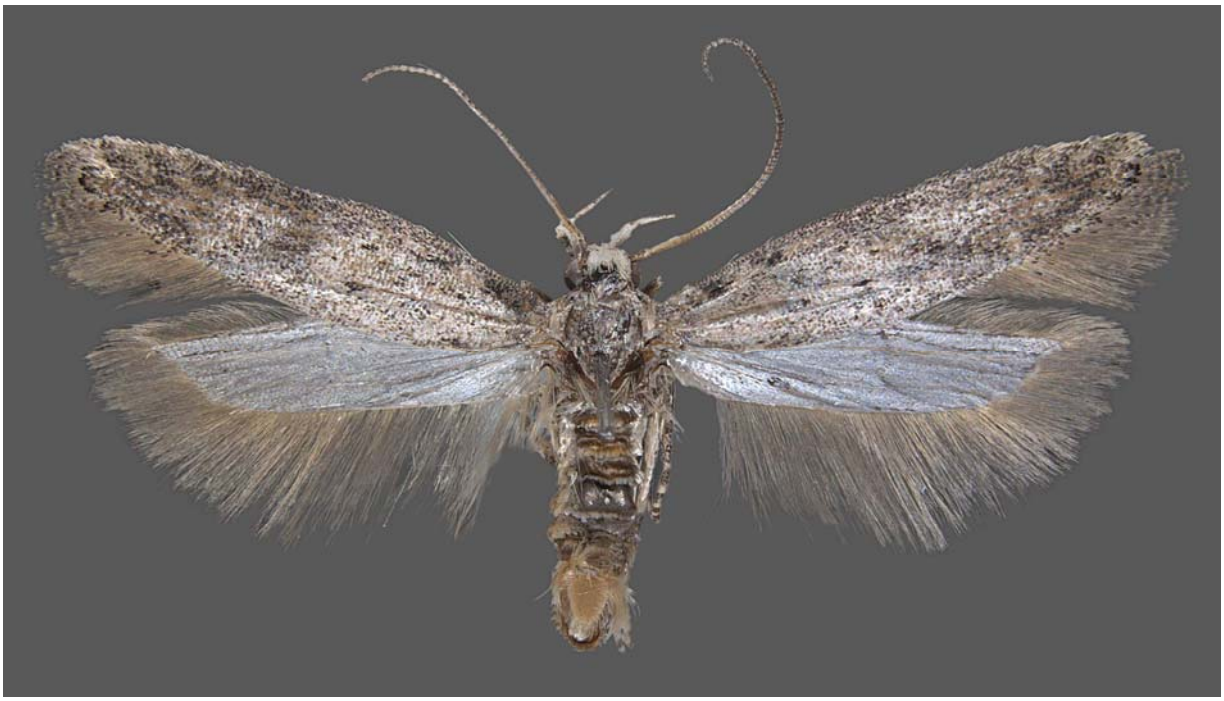

Figure 2

Figure 3

Figure 4