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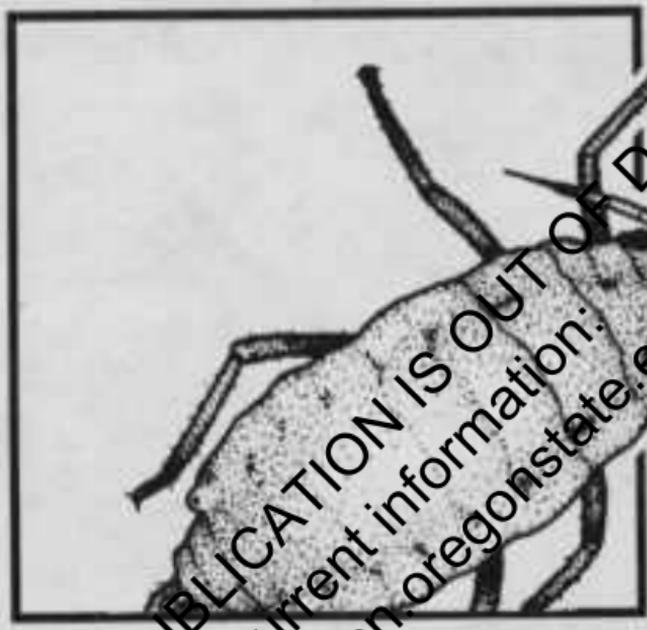
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NEW PEST ALERT

Russian Wheat Aphid

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Oregon State University
Extension Service
and
Oregon Department
of Agriculture

New Pest Alert

Russian Wheat Aphid

K.J.R. Johnson, R. Drapek, and G.C. Fisher

"New Pest Alerts" cover selected pests that very likely will have a major economic impact on Oregon's agriculture. Either these pests are new to Oregon, or they may arrive within months or a few years.

Each publication presents information about damage potential, description, life history, host plants, injury symptoms, distribution, and control methods.

Rapid detection of a new pest's entry into Oregon will greatly minimize its initial economic impact and long term effects on agricultural production. If you see a pest described in a "New Pest Alert," contact your Extension agent or a representative of the Oregon Department of Agriculture.

Damage potential

The Russian wheat aphid, *Diuraphis noxia*, could become one of the most important insect pests of wheat and barley in Oregon. Severe damage has been reported in several countries and in parts of the United States. Yield reductions of 50% and more have been recorded.

First discovered in the United States in 1986 in Texas wheat fields, this aphid species has quickly spread to ten States, including States as close to Oregon as western Idaho, northeastern Colorado, and Wyoming. Dispersed by wind or

carried on grass leaves, this insect is expected to arrive in Oregon anytime within the next year.

Description

The Russian wheat aphid (figure 1) is a relatively small green aphid, less than 2 millimeters long. It has an elongate, spindle-shaped body. It has very short antennae and may be distin-

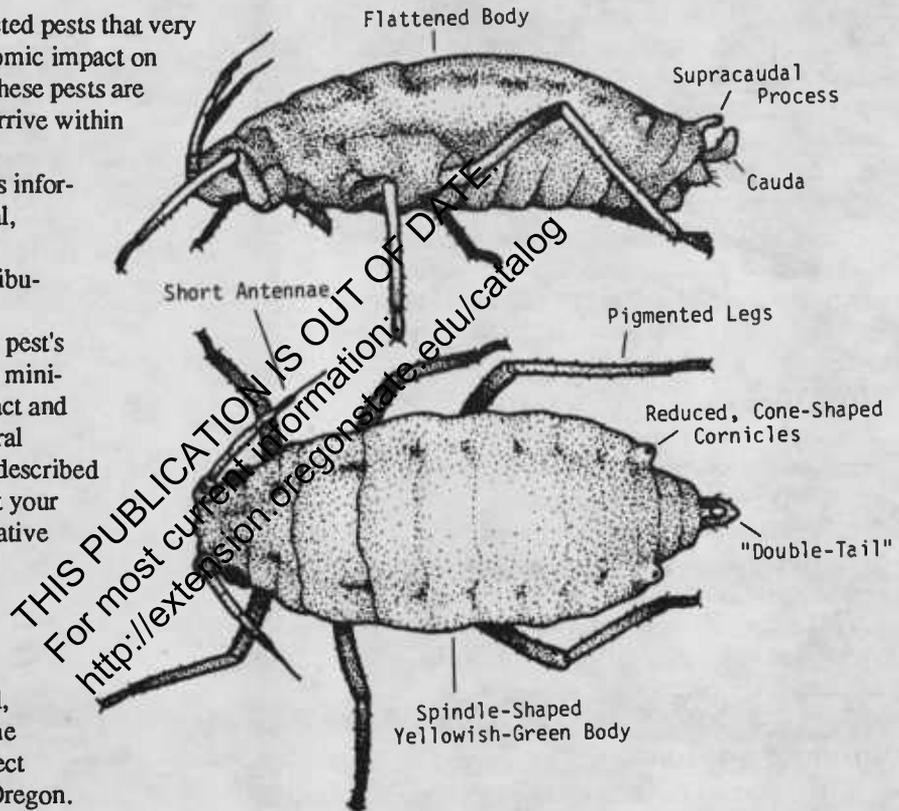


Figure 1.--Identification characteristics of the Russian wheat aphid (wingless female)

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guished from other aphids attacking small grains by: (1) a single, fleshy projection above the cauda (or tail) which gives the Russian wheat aphid its characteristic "double tail" appearance and (2) the extremely small size of tubular structures on the abdomen called "cornicles," which are typically found on other aphids.

Life history

The Russian wheat aphid is a sap-sucking insect that feeds mainly on the uppermost leaves of the plant. Margins of infested leaves will curl upwards, resembling a straw containing the aphids inside.

The aphid develops on wheat or other cereal or grass hosts in the fall and spring. During the summer, as cereal fields mature, the aphid must find alternate hosts, such as volunteer wheat or summer grasses. The Russian wheat aphid is expected to survive winters in Oregon.

Host plants

Wheat, barley, and triticale are most preferred among its economically important host plants. It can also feed and reproduce on oats and rye, but it's not as common on these hosts. Other grass hosts include various bromes (for example, rescue grass, and Japanese brome), timothy, jointed goatgrass, squirreltail, cheatgrass, little barley, and wild oats. Corn, Johnsongrass, and sorghum are apparently not used as hosts.

Injury symptoms

The Russian wheat aphid injects a toxin into the leaves on which it feeds. The toxin interferes with chlorophyll production, causing chlorosis (yellowing). This aphid attacks wheat plants from emergence until maturity.

Early season (from emergence to tillering). Damage may resemble that caused by drought stress. The field gets a grayish tinge with yellowing in some spots. Feeding on the upper

surface of the upper leaves causes a characteristic curling of these infested uppermost leaves. Leaves may get a slight purple discoloration.

Midseason. Some plants are stunted. Purple color in infested leaves becomes sharper. Tillers may lie prostrate to the ground. If a high population of aphids develops, white longitudinal streaking of the leaves can occur as a result of the toxin.

Late season (from the boot stage to heading). Stunting of the plants, spreading crowns, purple discoloration of the leaves, white longitudinal streaking on the leaves, and tightly rolled upper leaves become more pronounced. As the plants begin to head, the awns (or beards) may be caught in the rolled-up flag leaf, leading to a distortion of the head as it protrudes from the side of the flag leaf.

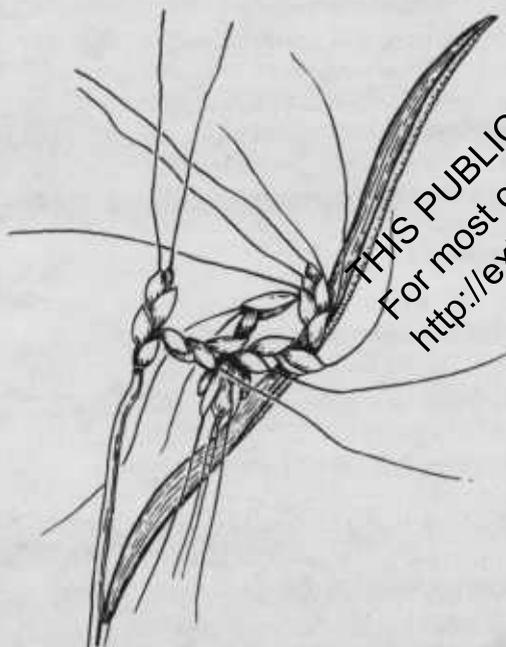


Figure 2.--"Fish-hook" or "loop" heads caused by Russian wheat aphid feeding

Figure 3.--Distribution of the Russian wheat aphid in the United States, 1987



Cereal heads may be distorted because they do not fully emerge from the rolled-up flag leaves. These distorted heads have been called "fish-hook" or "loop" heads because of their appearance (figure 2). Many seeds in a head may not fill because of the inadequate pollination resulting from this aphid's damage.

The Russian wheat aphid may transmit certain plant diseases. It has been implicated as a carrier of barley yellow dwarf, brome mosaic, and barley stripe diseases.

Distribution

The Russian wheat aphid is indigenous to southern Russia, where it has been recognized as a pest of wheat and barley since 1900. It is also a minor pest of small grains in the Middle East and around the Mediterranean coastal regions of Europe and North Africa. In 1978, the Russian wheat aphid was found in South Africa, where it causes severe damage to wheat.

In 1980, it was first found in the Western Hemisphere near Mexico City, Mexico. Since then it has spread northward to the United States, where it was first discovered in Texas in 1986.

Recent surveys have detected the Russian wheat aphid in ten States--Texas, New Mexico, Arizona, Oklahoma, Kansas, Nebraska, Colorado, Wyoming, South Dakota, and Idaho (figure 3). Its rapid dispersal within the U.S. has probably been caused by wind currents.

Control methods

Systemic and contact insecticides have been reported to provide good control in Texas. Although systemic insecticides have been applied to the soil at planting in South Africa, this practice is still under evaluation in the U.S.

Foliar sprays may be necessary later in the season, depending on the aphid population level and the stage of the plants to be protected. Ensuring that contact insecticides reach the aphids is a problem when the aphids are within rolled-up leaves.

The potential for biological control of Russian wheat aphids using parasitoids or predators in the United States is not known, but they do not appear to be important in South Africa. South Africans attribute this to the aphid's habit of generally staying within curled-up leaves.



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