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Russian Wheat Aphid

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The Russian wheat aphid, *Diuraphis noxia* (Mordvilko), is a new pest in Idaho and other western states. It was introduced into Mexico in the late 1970's or early 1980's. The first confirmed U.S. infestation was reported in Texas in the spring of 1986. Since then its range has expanded to include most of the western states. As its name suggests, the Russian wheat aphid is native to the southern part of the Soviet Union and the Middle East where it is a minor pest. In regions where it has been introduced, such as South Africa and North America, it has become a serious threat to grain production, causing yield losses of 50 percent or more.

The Russian wheat aphid was first found in Idaho in June 1987 when one specimen was collected in a suction trap at Parma. Soon thereafter, several infested wheat and barley fields were found in southwestern Idaho's Canyon County. By November 1987, the new pest had been collected from most wheat-growing areas of southern Idaho.

Biology

Russian wheat aphids infest wheat, barley and triticale as well as several wild and cultivated grasses. Broad-leaved plants, such as alfalfa, potatoes and sugarbeets, are not hosts. Volunteer grain plays a key role in the life cycle of this pest by providing a food source in the interval between grain harvest and emergence of fall-seeded crops.

Infestations can spread rapidly. Large numbers of aphids are produced in colonies inside rolled leaves. As the colonies become crowded or the plant declines, wingless aphids move to neighboring plants, eventually causing characteristic dead patches in the field. Crowded colonies also produce winged migrants that can infest plants farther away.

Russian wheat aphids appear to be extremely cold-hardy. Colonies were found overwintering in Colorado during 1986-87 despite temperatures as low as -10°F with little protective snow cover. The aphids overwinter on grain and also on winter annual or perennial grasses.

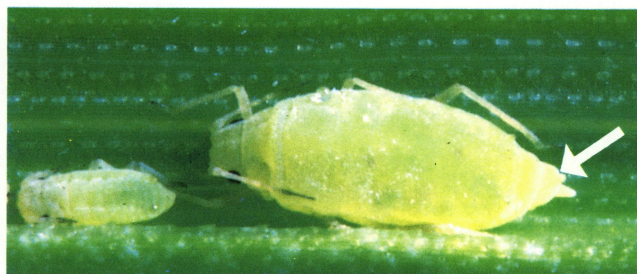


Fig. 1. Russian wheat aphid has a wart-like projection above the tail (see arrow).

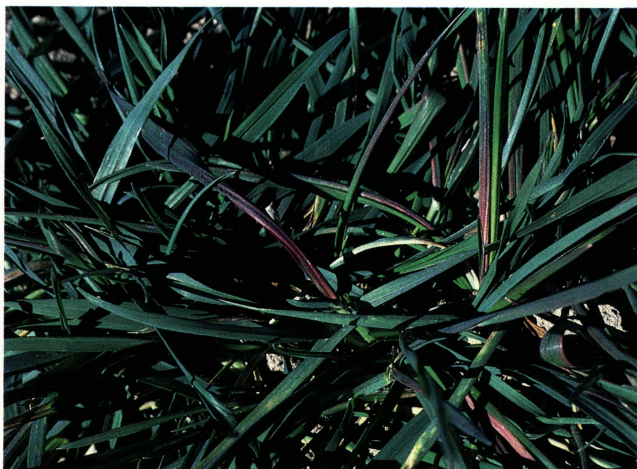


Fig. 2. Purple streaking and leaf rolling occurring in cool weather are common symptoms of Russian wheat aphid damage in wheat.



Fig. 3. Russian wheat aphids can be found inside leaf whorls (see arrow). White streaks at the base of the leaf are characteristic of warm weather symptoms.

Description

The Russian wheat aphid is relatively easy to identify. The aphid is light green, elongated and spindle-shaped. The antennae are very short. It has a wart-like projection above the tail that gives it a two-tailed appearance (see Fig. 1 on other side). The dorsal tubes (cornicles) are present but very short and not obvious.

Damage

Russian wheat aphid damage to grain is easy to recognize. The aphids secrete a toxin that causes leaf rolling and white (warm weather) or purple (cool weather) streaking on the leaves (see Fig. 2 on other side). Heavily infested plants are severely stunted and sometimes flattened. Heads of infested plants may become twisted and distorted and sometimes fail to emerge properly. Sometimes a large colony inside the flag leaf sheath can kill the head while leaving the rest of the tiller green. Damage in the field may first appear as patches of stunted or discolored plants that resemble drought-stressed areas. In other cases, the infestation is more uniform, and damaged plants will be distributed throughout the field. Whole fields can be lost if infestations are not detected and controlled early.

Detection

Early detection is difficult because the pest tends to hide in the plant. Colonies are most often found in tightly rolled leaves near the base of the leaf, in leaf whorls or concealed on the stem inside the flag leaf sheath (see Fig. 3 on other side). The easiest way to detect Russian wheat aphids is to look for the characteristic damage. Plants from several areas of the field should be thoroughly inspected for symptoms of aphid infestation. Mixed colonies of Russian wheat aphids and other species are common. Samples from suspected infestations may be taken to county agents or University of Idaho entomologists for confirmation.

Control

Table 1 shows the economic thresholds for control of Russian wheat aphid infestations in Idaho, and Table 2 lists chemicals that can be used for aphid control. In areas with high probability of infestation, the use of systemic insecticides at planting is recommended.

Table 1. Economic thresholds for the Russian wheat aphid.

Season	Plant growth stage	Threshold
Fall	Emergence to tillering	15 to 20% plants infested
Spring	(winter grain) Regrowth to flowering	10% plants infested
Spring	(spring grain) Emergence to flowering	10% plants infested
Spring	Beginning flowering	10% tillers infested
	Early milk stage	20% tillers infested

After the soft dough stage, insecticide treatment will have little to no benefit.

Table 2. Foliar-applied and systemic insecticides registered for control of aphids on small grains.

Insecticides	lb a.i./acre	Restrictions
Foliar-applied		
Di-Syston 8E		
Barley	1 lb	30 days to harvest; do not graze
Wheat	$\frac{3}{4}$ lb	30 days to harvest; do not graze
Cygon 400		
Wheat only	$\frac{3}{8}$ lb	14 days before grazing immature plant; 60 days to harvest
Parathion	$\frac{1}{2}$ lb	15 days to harvest
PennCap M	$\frac{1}{2}$ lb	15 days to harvest
Systemics		
Di-Syston		
Barley dryland	1 lb	At planting; 75 days to graze or cut for forage
Barley irrigated	1 lb	60 days to harvest; 30 days to graze or cut for forage
Wheat dryland	1 lb	At planting; 75 days to graze or cut for forage
Wheat irrigated	1 lb	30 days to harvest; 30 days to graze or green chop
Phorate 20 G		
Wheat only (over the plant)	1 lb	70 days to harvest; 30 days to graze or cut for forage

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