

Section IV.  
Cereal Crop Pests

MORE ON APHIDS AND THEIR NATURAL ENEMIES IN WASHINGTON WHEAT

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We are presenting the results of 5 years of cereal aphid and natural enemy sampling in large on-farm replicated plots in the arid and semi-arid grain production area of central Washington. These plots were the core part of the "Ralston Project," which was a multidisciplinary (10 disciplines), multi-year (1996-2000), and multi-agency/institution (USDA-ARS, WSU, Oregon State University) project to examine the economic and environmental feasibility of reduced-till and continuous annual cropping systems to replace or supplement the traditional winter wheat/fallow system. A characteristic of the latter system is wind erosion and winter annual grass weed problems. The four cropping systems represented in the plots were: 1) soft white winter wheat/fallow (traditional), 2) soft white spring wheat/fallow (no-till), 3) continuous hard red spring wheat (no-till), and 4) hard red spring wheat/spring barley (no-till).

The majority of aphids recorded were Russian wheat aphid (RWA) and English grain aphid (EGA), with other species (rose grass aphid, bird cherry-oat aphid) infrequently observed. Overall, more aphids were recorded on spring wheat than on winter wheat, a pattern observed by Elberson and Johnson (1995; *Environ. Entomol.* 24:538-549) in Idaho. An insecticide application was required to control RWA in hard red spring wheat in 1996 because populations approached or exceeded the economic threshold of 10% infested tillers (Pacific Northwest Insect Control Handbook). Economic infestations of RWA never developed in the plots between 1997 and 2000. EGA populations were highest in 1996 and 1997, and very low to non-existent between 1998 and 2000. An insecticide application was never required to control EGA. Hymenopterous parasitoids were infrequently reared from cereal aphids. By contrast, predacious ladybird beetles were fairly numerous in some years (1998, 2000) and may have regulated populations of EGA. *Hippodamia* spp. (mostly *convergens*) were the most common coccinellids encountered, with lower numbers of *Coccinella septempunctata* recorded.

In conclusion, spring-planted cereals are at greater risk of aphid-induced injury than is fall seeded wheat and cereal aphids and their natural enemies exhibit year-to-year variability in occurrence. Also, spring cropping systems had no effect on aphid populations.