OSWALD and Houston (16) established barley yellow dwarf as a serious disease of barley, (Hordeum vulgare L.) oats, (Avena sativa L.) and wheat (Triticum aestivum L.) in California in 1953. Oat red leaf and barley yellow dwarf were shown to be identical (21) in 1956. The disease is now known to be widely distributed on cereals in the United States (3, 17), Canada (19), Europe (3, 17), and New South Wales (17). In 1959 yellow dwarf (13) caused severe damage on winter and spring oats in the Pacific Northwest and the North Central States. The oat varieties 'Newton', 'Putnam', and 'Tonka' performed considerably better than others, suggesting that resistant varieties offer the best means of control.

From 1955 to 1958, over 10,000 oat selections were evaluated in field and greenhouse tests at Urbana, Illinois, for their yellow dwarf reaction by infesting plants in the 3-leaf stage with viruliferous apple grain aphids [Rhopalosiphum padi (Sanderson), referred to by some workers as R. padi]. Results of these evaluations, a list of the more tolerant oat selections, and observations demonstrating that resistance in oats is heritable are presented in this paper.

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MATERIAL AND METHODS

The term "selection" is used to denote any oat species, variety, or line that was evaluated and the term "strain" to denote BYDV isolates which manifested uniform and consistent symptoms. Strain uniformity was tested at intervals by determining the reaction...