

which they were collected. Most pathogens isolated in Chunra province were able to cause disease on Xa3 monogenic lines but most pathogens isolated in Kyungi, Chungchung, and Kyungsang province were not able to cause disease on Xa3 monogenic lines. The high frequency of race K3 isolates in the Chunra region may have resulted from the dominant cultivation of Xa3 deployed cultivars such as Shindonjin, Dongjin1, and Junam. Almost all isolates in Korea were not able to cause disease on Xa4 resistant monogenic lines. Therefore, Xa4 may be a good source for resistant rice breeding in Korea. Based on the reaction of isolates to monogenic lines, the Korean isolates were grouped into 19 different pathotypes. The reaction of 19 different pathotypes to 34 generally cultivated rice cultivars in Korea were tested. Among the 34 tested rice cultivars, only few cultivars showed resistance to tested 19 pathotypes. Youngnam and Whayoung showed good resistance to most tested pathogens and Kewha showed good resistance to some pathotypes but it showed severe disease symptoms by some pathotypes.

H-83 Variation in infection levels of western white pine seedlings grown in three nurseries in northern Idaho. Kwan-Soo Woo¹, Lauren Fins² and Tae-Su Kim
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Western white pine (*Pinus monticola* Dougl.) seedlings grown for two growing seasons in three nurseries in northern Idaho were compared for infectability when inoculated with basidiospores of *Cronartium ribicola*. Eight needle traits, including surface wettability, were evaluated relative to nursery location and infectability. Statistically significant differences were found in needle length and width, stomatal rows, stomata per row, stomata per needle, adaxial surface area, stomatal density, and contact angles of applied water droplets. Lewiston Nursery seedlings had the lowest stomatal density and the lowest spore germination percentage, but the highest mean level of infection, and highest infection efficiency. Lewiston seedlings also had the smallest needles and lowest needle surface wettability (highest contact angles). Since genetic, environmental and physiological effects were confounded in this study, the effect of nursery environment on morphological traits and infectability of seedlings with *Cronartium ribicola* could not be determined. However, the relationship between the high level of infection and the immature developmental state of the seedlings grown in the Lewiston Nursery is intriguing and suggests that with physiological immaturity, resistance mechanisms may not be fully developed. Further investigation of these relationships should be conducted using a single genetic source and comparable developmental states in different environments.