

THE ECOLOGICAL BASIS OF DIFFERENCES IN SEVERITY OF WEEDS IN WINTER RAPE BETWEEN THE U.S. AND EUROPE. Robert H. Callihan, University of Idaho, Moscow, Idaho, 83843, U.S.A. and Stanislaw W. Gawronski, Warsaw Agricultural University, Warsaw, Poland.

In Europe, weeds constitute a major production challenge for winter rape, whereas in the U.S., winter rape fields are normally so weed-free that production of this crop constitutes a superior weed control practice. Between these two regions, significant differences in weed species occur; however, the difference in severity of weeds is due to differences in climate and consequent soil moisture management. In central Europe, where uniform growing-season precipitation prevails, winter rape is successfully planted in late summer or early autumn following harvest of a rotation crop. Winter weeds are able to germinate and vigorously compete with the crop. In the continental climate of the northwestern U.S. where winter rape is grown, the lack of summer precipitation precludes planting winter rape following a crop grown that same summer, for the prior crop extracts the soil moisture, which is generally not replaced until fall or winter. Therefore, if rape were fall-planted following that crop, it would germinate so late that it would not be able to attain enough growth for adequate winter survival or yield potential. Consequently, farmers plant in midsummer after summer-fallow tillage, which is performed to retain soil moisture. Rapeseeds are planted into moist soil underlying 5-10 cm of soil that is too dry for germination of most weed seeds. Some summer annuals (Amaranthus spp., Chenopodium spp.) may grow, but these die with fall frosts. Rapid germination and growth of winter rape under these conditions of dry summer, dry surface soil, moist subsoil and warm temperatures enable the rape rosettes to rapidly attain such size and vigor that the later-germinating winter weeds are well suppressed, and weeds germinating the next spring are largely eliminated.