

Competitive ability of cultivated rice against weedy rice biotypes – A review

ABSTRACT

Weedy rice has been identified as a threat to rice production worldwide. Its phenotypic and genotypic diversity and its potential to compete against rice in all development stages from germination to maturity have resulted in a loss of rice yield and grain quality, which is remarkably high in direct-seeded rice cultivation. Weedy rice dormancy varies, it has a higher germination rate, and tolerates deeper germination depth compared to rice cultivars. Interactions of weedy rice with cultivars often reflect early vigor, more tillering, nutrient utilization ability for shoot development with respect to rice cultivars even though the latter also show an improvement in shoot development under competition. An exponential relationship has been reported between cultivated rice loss and weedy rice density: this is true for all rice cultivars. The degree of loss is dependent on the competitive ability of the rice cultivar being studied, and each weedy rice biotype also interacts differently. Hence, the need for a comprehensive study of the biology of various weedy rice variants. Difficulties arise in the management of weedy rice due to its physiological, anatomical, and morphological similarities to cultivated rice. The manipulation of the environment to improve cultivated rice production and suppress the emergence of weedy rice variants is important in the management of weedy rice, as well as other cultural practices and use of pesticides. The development of herbicide-resistant rice cultivars is necessary to totally eliminate the weedy rice variants. This review provides information on the competitive ability of weedy rice against rice cultivars; this information is essential to create management options to control weedy rice.