A FACILE METHOD TO MEASURE ROOT ANGLE OF CEREALS

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Abstract

Cereals are the most important component of human diet. To meet the food demand by 2050, the rate of gain in cereal yield must be 2.4%. However, the current rate of yield gain is about 1%. Further, abiotic stresses such as drought possess seriously hinders the increase in productivity of cereals. Deep rooting is a major component trait that contributes to dehydration avoidance under drought in most crops. Root angle plays important role in determining the deep rooting. Root angle is a dynamic trait and is regulated by external as well as internal factors. It can be constitutive or inductive. Depending upon the genetic makeup of a genotype and its environmental conditions, there can be wide variability in root angle among genotypes and within the genotype. Currently this variability is not utilized to great extent due to the phenotyping bottlenecks. Although, many methods are available to measure root angle in cereals, these methods are expensive, complicated and time consuming. For root angle phenotyping, a reliable and high throughput method is needed to screen large number of genotypes in a very short span of time. Here we have developed a novel method to measure root angle which is easy, robust, cheaper, and does not require special training and equipments. Using this method, we phenotyped 29 rice genotypes and 24 wheat genotypes under field conditions. The developed method captured the variability accurately and wide variability was found among genotypes for root angle in both rice and wheat.