

Research On Flooding Tolerance

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Excess rain and over-irrigation on poorly drained fields or low lying areas can result in flooding injury to soybeans. Soil water-logging is more common than complete submergence and is also less damaging. Soil water-logging can reduce soybean yield 17 to 43% at the vegetative growth stage and 50 to 56% at the reproductive stage (Oosterhuis et al., 1990). Genetic variability for water-logging tolerance has been shown among soybean cultivars in maturity groups II and III (VanToai et al., 1994). Soybean plant introductions (PIs) could offer higher levels of tolerance than current soybean cultivars. The objective of this study was to evaluate current maturity group III, IV and V soybean varieties and a set of plant introductions (PIs) collected from wet and dry regions of China, Japan and Korea for tolerance to severe soil water-logging.

Varieties and plant introductions were planted in three replicate hills at ten seeds per hill. Plots were flooded about two inches deep at bloom R1-R2 for 5-14 d until plants in hill plots began to yellow, wilt and die. Water was drained and plots were rated on a scale of 1, no injury, 2 slight injury or yellowing, 3 moderate injury, 4 severe injury, and 5 dead. This research is being supported by grower check of dollars from the Southern Soybean Regional Project (SSRP).

Ratings of most tolerant soybean varieties from 2008 trials are as follows:

Group IV- 8 tolerant out of 122 tested

Asgrow AG 4705 3.5 1 rep only

Trisoy 4586 RR (CW) 2.0 1 rep only

Asgrow AG 4404 3.0

Southern Cross Caleb 2.5 1 rep only

Progeny 4908 2.8

Delta Grow 4820 RR 3.0

Asgrow AG 4303 2.5 1 rep only

MPG 4808 RR 3.5

Group V- 20 tolerant out of 72 tested

USG 715NRS 3.5

Progeny 5107 3.5

Delta Grow 5160 RR STS 3.0

USG 75Z38 2.5

Dyna-Gro 32A53 3.0

Pioneer 95Y40 3.5

Morsoy RT 5288N 3.3

Progeny 5218RR 3.3

Terral TV 54R28 3.3

Progeny 5308 RR 3.5

Morsoy 5506N 3.5

Dyna-Gro 33B52 3.5

Merschman Everest 3.5

Dyna-Gro 33C59 3.0

Hornbeck HBK 5226 3.5

Terral TV 55R15 3.5

Progeny 5650 3.5

Gateway R501 3.5

Schillinger 557 3.3

Delta-Grow 5280 3.5

Scores based on 1 (no injury) to 5 (dead)

Varieties in this year's soybean variety test are being evaluated in 2009 to determine varieties which are consistent in tolerance over years. In addition, several plant introductions which had greater tolerance to flooding than soybean varieties listed above are being evaluated further for flood tolerance. Δ

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