PREDICTIVE ANALYTICS IN COTTON BREEDING

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Abstract

Cotton breeding in general has always been a predictive science driven by new technologies and new knowledge. Phenotyping progeny in cotton breeding programs for yield and fiber quality has always been a limiting factor. The availability of inexpensive genotyping technologies (such as GBS) has enabled new Genomic Selection technologies to be applied to selection in varietal crops. Despite challenges and a slow start, the next 5yr will see extensive progress in applications of GS which will increase genetic gain for lint yield and fiber traits. There is reason for optimism based on published results in soybean, wheat and tomato. GS can also unleash valuable diversity in cotton gene banks and facilitate pre-breeding. Coupling GS with HTP as predictor traits in the GS model can increase the prediction accuracy. Predictive analytics utilizes all available to the breeder and is built upon the burgeoning field of data science, big data and IoT. This is widely applied to fields as diverse as medicine, finance, retail, logistics and social media. Application of appropriate models coupled with machine learning has great potential in cotton to “pass through” to the cotton grower in the next 3-5 years.