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Identifying allele combinations for maximizing soybean adaptation to tropical environments

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Soybeans were domesticated in East Asia and have been utilized for food in Asia for at least several millennia. The photoperiod sensitivity of soybean is a major constraint to increasing seed yields and expanding adaptation to different environments. Along with significant historical production in China and India, over the past century, plant breeders have released soybean varieties that have thrust soybean into a major commodity crop for its high value vegetable oil and protein-rich meal in North and South America. Soybean holds promise as a food security solution for small holder farmers in Africa. Soybean breeding directed at photoperiod sensitivity and adaptation is critical to expanding successful soybean production in Africa. Our research objective is to use molecular genetics in conjunction with soybean breeding to develop a platform that includes the soybean maturity genes, the long juvenile trait, and alleles controlling stem architecture to maximize soybean adaptation and yield stability for our target areas in Africa. The results of this research should provide a foundation for soybean breeding to increase the ability to capture desired traits from diverse soybean lines with a system to select for optimized adaptation to the target African environments.