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A non-destructive genotyping system from a single seed for marker-assisted selection in watermelon

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ABSTRACT. Genomic tools for watermelon breeding are becoming increasingly available. A high throughput genotyping system would facilitate the use of DNA markers in marker-assisted selection. DNA extraction from leaf material requires prior seed germination and is often time-consuming and cost prohibitive. In an effort to develop a more efficient system, watermelon seeds of several genotypes and various seed sizes were sampled by removing ⅓ or ½ sections from the distal ends for DNA extraction, while germinating the remaining proximal parts of the seed. Removing ⅓ of the seed from the distal end had no effect on seed germination percentage or seedling vigor. Different DNA extraction protocols were tested to identify a method that

could yield DNA of sufficient quality for amplification by polymerase chain reaction. A sodium dodecyl sulfate extraction protocol with 1% polyvinylpyrrolidone yielded DNA that could be amplified with microsatellite primers and was free of pericarp contamination. In this study, an efficient, non-destructive genotyping protocol for watermelon seed was developed.

Key words: DNA; Sodium dodecyl sulfate; Germination; Vigor; Polyvinylpyrrolidone

