

**VARIATION IN SEED OIL AND PROTEIN CONTENT AMONG DIVERSE COTTON (*GOSSYPIMUM SP.*)****GERMPLASM****Patrick Horn****Shana Brewer****Joel Robinson****Roberto Rodriguez****Zhenhua Shang****Nick Wheeler****Center for Plant Lipid Research, Department of Biology, University of North Texas****Denton, TX****Lori Hinze****Richard Percy****USDA/ARS, Southern Plains Agricultural Research Center****College Station, TX****Kent Chapman****Center for Plant Lipid Research, Department of Biology, University of North Texas****Denton, TX****Abstract**

Cottonseed embryos are comprised of oil and protein reserves that serve as a vital carbon, nitrogen and energy source during seed germination. These storage compounds also are a source of commercial vegetable oil and protein meal. Most historical surveys for quantifying either seed oil and/or protein use chemical-based extractions that are time-consuming and destructive. Low-field, time-domain  $^1\text{H}$  nuclear magnetic resonance (TD-NMR) represents a rapid, non-destructive, method for simultaneously quantifying oil ( $R^2 = 0.99$ ) and protein ( $R^2 = 0.97$ ) levels within cottonseed embryos. This method permits accurate, non-destructive quantification of seed reserves with a minimal amount of material for screening large collections of diverse germplasm. Analysis of representative samples of the U.S. cotton germplasm collection revealed that the hybridization of selected cotton species (i.e. *hirsutum*, *barbadense*, etc.) appears to have minimized variability in seed protein and oil content. Oil and protein data will be used for identifying accessions that might be useful for breeding programs interested in manipulation of these seed traits.