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Conservation Tillage Impacts on Soil Quality

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As recent as the 1970's in University lecture halls cotton production was vilified for being "hard on the soil". This stigma is still perpetuated today in the popular press, deserving a close scrutiny of its origin and its reality as soil quality is an essential but unappreciated component of cotton's unique tolerance to heat and drought. The objective of expanding food, feed and fiber production to meet the global demand, during forecast climate disruption requires that scientists improve both the above and below ground components of agriculture. The latter has been termed the "final frontier" for its inaccessibility and complexity. The shift to conservation tillage in the U.S.A. over the previous three decades has been dramatic in multiple crops. Cotton and its major rotation crops (corn, soybean, and wheat) can be grown for multiple years without tillage using herbicides instead to control weeds. Although pesticide resistant insects and weeds (especially to Bt proteins and glyphosate) are a threat to Integrated Pest Management and conservation tillage that need vigilance and proactive management, the role of modern production tools in meeting agricultural objectives to feed and clothe the world is huge. The impact of these tools on soil quality will be reviewed. In addition ongoing research efforts to create production practices to further improve soil quality and meet the growing challenges of heat and drought will be reviewed.