

66th Annual Meeting of the Soil Science Society of North Carolina

Speaker Confirmation Form and Information for Proceedings

Return by March 1st, 2023 to: Justin Milstein at justin.milstein@wake.gov

Presentation Title: Common Questions Related to Peanut Agronomy and Fertilization Practices in North Carolina

Presenter: Dr. David Jordan

Date: April 17th, 2023 Session: Session 2: Agronomic Sciences

Time: 3:00 PM – 3:30 PM

NOTE: If you are unable to fulfill this obligation, please contact Justin Milstein 919-210-1734 before attempting to arrange for your own replacement speaker.

Speaker attendance is free for the day that you are presenting, please visit the following link for registration: <https://ssnc.ticketleap.com/66th-annual-meeting-of-the-soil-science-society-of-nc/>

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Discount Codes for Speakers:

speaker1day – 100% off 1-day registration

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Does your presentation include video and/or require internet access: Yes **No**

1. Please make any corrections to your presentation title, presenter name (including title) above.
2. Your company, agency, or organization: North Carolina State University
3. Your position title: WNR Professor and Extension Specialist
4. Your brief biography including years in industry and key experience:

David has been a faculty member at North Carolina State University and currently has a three-way appointment (academic, research, extension.) His primary focus is peanut-based cropping systems which includes research and extension projects associated with tillage, crop rotation sequence, fertility, plant growth regulation, variety development, and principles of harvesting. David also

develops recommendations for weed management in peanut and integrated pest management across pest disciplines in concert with faculty and staff in other departments, universities, and agencies. David has been active in USAID-funded research projects in sub-Saharan Africa since 2002 designed to minimize negative impacts of pests on peanut, increase peanut yield, and minimize aflatoxin contamination. David co-instructs the course *Soil-Crop Management Systems* with Dr. John Havlin and is the instructor for the course *Integrated Pest Management* in the Department of Crop and Soil Sciences.

Abstract:

Peanut is an important legume crop in North Carolina, the southern United States, and many countries around the world. This crop is unique in that reproductive structures are borne from above-ground flowers. A peg emerges from the flower and subsequently migrates to the upper few inches of soil. Virginia market type cultivars are the predominant cultivars grown in North Carolina. Peanut growers and their advisors often ask questions about calcium nutrition, nitrogen fixation, tillage systems, and cropping sequence. In this presentation, the relationship of soil pH and gypsum, factors that influence peanut response to *Bradyrhizobia* inoculant, and current information on adoption of conservation tillage practices will be discussed. Key findings and recommendations to growers include: a) maintaining adequate soil pH across fields to ensure a positive response to inputs including gypsum and inoculants for nitrogen fixation, b) financial return from inoculants based on cropping sequence and approaches to correcting nitrogen deficiencies, and c) challenges associated with adoption of reduced tillage practices. Applying calcium sulfate to peanut growing in low pH environments can decrease yield while application to of gypsum to peanut in pH environments around 6.0 results in increased yield. Financial return from commercial inoculants applied in the seed furrow at planting was 4:1 in fields with a history of recent peanut production and 50:1 in new ground fields with no history of peanut. A broadcast rate of ammonium sulfate at 100 pounds of actual nitrogen/acre can increase yield when a nitrogen deficiency is observed. Obviously, this is much more expensive and slightly less effective than inoculation. With the exception of new ground fields, prediction of a positive response to inoculant is not well correlated with length of rotation. In some cases, pesticides and fertilizer products applied with inoculant can negatively impact performance. Currently, approximately 30% of farmers in North Carolina use conservation tillage for peanut production. Peanut growers are also using less intense primary and secondary tillage in North Carolina compared with production two decades ago. However, digging losses can be greater on finer textured soils in reduced tillage systems compared with conventional tillage. A risk index has been developed to assist practitioners relative to adoption of tillage practices for peanut. Although peanut often responds differentially to cropping sequence and tillage system, interactions of cropping sequence and tillage system are seldom observed in research trials relative to yield. Elevated zinc concentrations are a major concern in some fields in North Carolina where animal waste has been applied and peanut is planted. Additional research is needed to refine recommendations currently used by NCDA&CS and NC State University on risk to zinc along with research to determine if adequate amounts of zinc can be removed from fields that are suitable for peanut production.