CLIMATE AND CROPS IBOOK – A RESOURCE TO HELP SOUTHEAST FARMING ADAPTING TO A

VARIABLE CLIMATE Brenda V. Ortiz **Austin Hagan Kathy Flanders Edward Sikora Dale Monks Dennis Delanev Kris Balkcom** John Beasley Steve Li **Auburn University** Auburn, AL Robert (Bob) Kemerait **R. Scott Tubs** Scott Monfort Mark Abnev **David Buntin** Jerry Johnson Pam Knox The University of Georgia Athens, GA **David Zierden** Florida State University **Center for Ocean-Atmospheric Prediction Studies** Tallahassee, FL **David Wright** University of Florida Gainesville, FL William Birdsong **Ronald Smith Timothy Reed** Ayanava Majundar James Langcuster Jennifer Crickard Alabama Cooperative Extension System Minette, AL

<u>Abstract</u>

The diversity and differences that make the agricultural production in the Southeast unique also challenge farmers. They must cope with frequent droughts, several crop pests and diseases, and degraded soils with low organic matter. These farming threats are exacerbated by a variable climate influenced by ENSO and climate change. The "Climate and Crops" iBook has been developed to help farmers and crop consultants adapt Southeast farming to a variable climate. Information included in the book was collected during meetings with Extension specialists and farmers. The iBook is focused on the five main Southeast row crops – cotton, corn, soybean, peanut, wheat. Each chapter includes sections dealing with potential climatic conditions that might occur during a crop growing season and how these affect each crop in terms of planting, crop growth and development, insects, weeds, disease pressure, and harvest. Along with the risks, adaptation strategies to cope with each one of these climate-related farming scenarios are listed. The "Climate and Crops" can be downloaded free from Apple iBooks.

Introduction

In recent years, agricultural production has been challenged by climate variability and extreme weather events associated with climate change. Coping with these farming scenarios implies adaptation of management practices and adoption of proactive strategies. The challenge, then, is how to increase preparedness and anticipate risks. The incorporation of the climate forecast into the existing decision-making processes is the key. This iBook outlines climate-based crop production risks and the corresponding risk management strategies. The objectives of this iBook are: 1) Increase awareness and knowledge on the sources of Climate variability in the Southeast US and use of climate forecast2, Increase awareness and knowledge on the impact climate has on crop production, 3) Provide the farming community in the Southeast with risk management strategies to cope with a variable climate.

Methods

Since 2010, a group of climate scientists, extension specialists, anthropologists, extension agents from five universities in the Southeast U.S. have been working on increasing climate literacy among the farming community in the region and the development of tools to improve preparedness and response to weather and climate conditions. With funding from USDA-NIFA, this group conducted several activities to understand the impact multiple climate and weather scenarios on crop production and how farmers react and adapt. Over the course of almost six years of several climate-adaptation related meetings, extension personnel and farmers have expressed the need for information on the potential impacts of climate on crop production and adaptation strategies. This iBook was prepared with the intention of cover that need for information. Data and information for this iBook was collected mainly from the interaction with farmers and extension specialists during these three main activities:

- 1) **Tri-state Climate Working Group for Row Crops Agriculture.** Biannual meetings for knowledge exchange and learning allowed the discussion and identification of management options for adapting production systems in the face of a changing and variable climate.
- 2) Climate Adaptation and Exchange Fair. This fair, scheduled every year, highlighted six to eight agronomic management practices to cope with climate variability. The interaction with farmers during those meetings allowed the identification of pros and cons of some strategies and new strategies on the horizon.
- 3) Face to face meetings with Extension Specialists. The Delphi Technique, a method of group decision making and forecasting that involves successively collating the judgements of a panel of experts (Wikipedia), was used to collect information from more than 30 Extension specialists. Crop-specific meetings were scheduled with specialists in Agronomy, Entomology, Plant Pathology, Weed Science, Cropping systems, Climatology. Potential climate-scenarios were outlined and discussions were based on the risks those scenarios impose on each crop (planting, growth, pests, diseases, weeds, harvest) and some of the main strategies to minimize those risks.

Results

The iBook has SIX chapters: Climate, basic concepts of climate variability, and five crop-related chapters: Cotton, Corn, Soybean, Wheat and Peanut. Each chapter has two sections: 1) Basic information on key management practices, 2) Climate risks impacting production and adaptation strategies







The section on key management practices provides a general background on the main aspects that are involved on producing a crop. The second section of each chapter is focused on potential climate impacts on crop production and risk management strategis. Possible climate scenarios that might occur during a crop growing season are presented on each chapter. For each climate scenario (e.g. drier and hotter spring, wetter and cooler summer), possible climate-related risks of planting conditions, pests and diseases, weeds, and harvest production are outlined. Each climate scenario is identified by a horizontal color-coded bar on the top of each page. For each climate-related risk condition, management strategies to minimize risks and reduce yield losses are provided. The iBook offers multiple interactive options: videos, interactive maps, graphs, and hundreds of images related to problematic insects, diseases and weeds.

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People can download the Climate and Crops iBook for free at the Apple store (http://apple.co/2jM62GF).

Summary

The Climate and Crops iBook was developed to educate the farming community on the impacts of climate on the major five row crops in the Southeast and potential adaptation strategies. This is the first iBook of this kind produced in the Southeast and perhaps the USA. The outcome of this iBook is to help the SE farming community reduce the risk of climate on row crops and to be better prepared for the potential impacts of climate change.