Development of a Comprehensive Website and Decision Support System for Peanut Pest Management in the Virginia-Carolina Region

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Introduction

Integrated pest management (IPM) is an essential part of any successful peanut program. The interactions between multiple pest species and crop/pest management strategies are complex. Production and pest management costs can vary considerably and influence a grower's decision to employ certain management practices. Growers and their advisors may have a difficult time weighing the positive and negative impacts of different strategies. Many important peanut pest management decisions must be made prior to planting.

Project PI's at *North Carolina State University* and *Virginia Polytechnic University* have developed a comprehensive website (www.peanut.ncsu.edu) and web-based decision support system (www.peanut.ncsu.edu/risk/) to assist growers in Virginia and North Carolina who are involved with the production of Virginia-Carolina (VC) – type peanuts.

Objectives

1. **Decision Aid:** To help growers and their advisors in assessing potential risks and benefits of competing management strategies.

2. **Website:** To help these stakeholders identify and manage pests, as well as provide copies of pest management documents.

Materials and Methods

The **decision aid** is based upon data compiled by project PI's. Previously validated risk indices for tomato spotted wilt virus (TSWV) and southern corn rootworm (SCR) were used as a framework for the program. The decision aid is intended for use in pre-season planning. Users provide field-specific information and management plans for the upcoming field season (including cultivar, plant population, planting pattern, field history, irrigation, planting date, rotation crops, soil pH, soil drainage and texture, in-furrow insecticides, nematicides, tillage, and disease management).

Pests included are **diseases** [including Cylindrocladium brown rot (CBR), early leaf spot, late leaf spot, Sclerotinia blight, Southern stem rot, TSWV, and web blotch]; **arthropods** (SCR and spider mites); and **nematodes** (northern root knot, peanut root knot, and sting).

Project PI's also compiled an Overall Risk Category that is weighted to help users consider each pest in comparison with the other pests. Production Cost Estimates were also included in the decision aid, and help the user to view the economic consequences of various production and management practices.

Materials and Methods

The **website** aims to be a clearinghouse for all information related to production of VC-type peanut. Project PIs created over 40 individual information sheets that detail (using text, tables and photos) various production and management topics (e.g., planting, harvest, and maturity), including identification and control of important diseases and insects. Each of these sheets is available via .html or .pdf formats on the website. Weed identification sheets from The Virginia Tech Weed Identification guide (www.ppws.vt.edu/weedindex.htm) are also available through the site. The website also features a key word index that links like-publications and topics, alerts about timely production issued during the growing season, individual personnel pages for various university employees involved with peanut production, and links to extension publications (management summaries, articles, manuals, and reports).
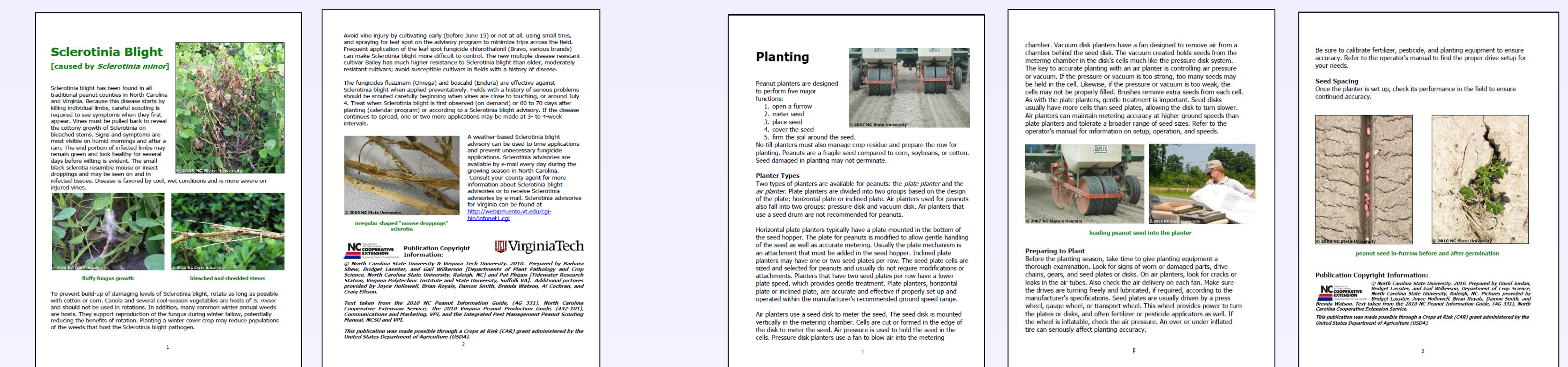
The Decision Aid

The Information Sheets

The Website

Demonstration & Evaluation

Both the **decision aid** and **website** were demonstrated to extension agents and growers in NC and VA through field days and workshops. Demonstration test plots were established in 2008 and 2009 to evaluate differences in SCR and Sclerotinia Blight. Project PIs demonstrated the utility of the program using posters and live computer demonstrations. They also displayed field plots and discussed the resulting risk indices for various pests. Risk index values were discussed, and agreements were made about the values for pests that exist in both states.

In an effort to validate the decision aid, field surveys were completed by extension agents using real pest management scenarios from peanut fields located in their counties from 2008-2010. Pre-season agronomic information was collected about each field (including pesticide use and known field histories of pests). Follow-up surveys were completed to evaluate the end-of-year pest incidence and severity. This information will be used in the future to validate that the decision aid is giving accurate predictions.

Finally, the website and decision aid were demonstrated to extension agents from NC and VA in a workshop in 2010. Agents were able to view the various features of both programs, ask questions, and make recommendations.