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NATIONAL PEANUT BOARD/SOUTHEAST PEANUT
RESEARCH INITIATIVE
FINAL REPORT FOR WORK
DONE UNDER RESEARCH AGREEMENT

Final Report

March 31, 2012

INSTITUTION: USDA/ARS

PROJECT TITLE: Determining Optimum Plant Stand for Making an Economically Viable Replant Decision, and Other Stand Implications on Pest Incidence

RES. AGR. NO.: 50-6602-1-006 PROJECT LEADER: Dr. Carroll Johnson
GACCP Control NO.: 4-966

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FINAL REPORT:

Trials were conducted from 2009 to 2011 to measure the effect of a consistent and repeated skippy peanut stand on weed control in peanut. Skippy stands were created by using a two-part epoxy adhesive to fill holes in vacuum planter plates. Holes were filled to create skips 30 cm (12 in.) and 60 cm (24 in.) in length, with the skips repeated in a regular and recurring pattern. Similar plates without any filled holes were used to create a normal stand without any intentional skips. The three seeding patterns were used in combination with six weed control programs for a total of eighteen treatment combinations. Weed control programs evaluated were (1.) Valor PRE, Cadre EPOST, and 2,4-DB POST; (2.) Valor PRE, Gramoxone Inteon + Basagran VE, Gramoxone Inteon + Basagran + 2,4-DB EPOST, 2,4-DB POST; (3.) Cadre EPOST, 2,4-DB POST, (4.) Gramoxone Inteon + Basagran VE, Gramoxone Inteon + Basagran EPOST, 2,4-DB POST; (5.) handweeded control; (6.) nontreated control. The weed control programs were structured to test herbicide systems that use residual herbicides, postemergence herbicides that have no residual weed control, and combinations of the two. The handweed control was included to determine the outright yield potential of peanut with skippy peanut stands without the confounding effects of weed escapes. Data measured were final plant stand, densities of weeds escaping control, and peanut yield.

The technique chosen to create repeatable skippy peanut stands performed flawlessly. Peanut with 30 cm skips had peanut yields only 5% lower than the normal stand. Peanut with 60 cm skips had yields 27% lower than the normal stand. Weeds escaping control were more numerous in peanut with 60 cm skips. Weeds present in peanut with 30 cm skips were similar to peanut with normal stands. Within each skippy pattern, interesting responses to herbicide programs were noted. In the normal stand and peanut with 30 cm skips, overall weed control and peanut yield response did not differ among the herbicide programs (excluding the handweeded control and nontreated control). However, in peanut with 60 cm skips weed control programs that used Valor PRE and/or Cadre POST had better weed control and peanut yield compared to weed control programs that used postemergence herbicides with no residual weed control.

A handweeded control was included with the original intent to measure the effects of skippy peanut stand on peanut yield, without confounding effects of weed control. Admittedly, this was a difficult treatment to successfully implement due to large amounts of weeds escaping control. However, weeds were successfully controlled with handweeding when peanut had a normal stand. Skips of 30 cm or 60 cm made weed control difficult with handweeding alone and peanut yields were reduced.

There are several conclusions that can be made from this research trial. First, an intact uniform peanut stand will lessen the need for expensive residual herbicides. Residual herbicides (Valor, Cadre) greatly improved weed control when peanut stands were skippy, particularly when skips were 30 cm. Residual weed control using these herbicides suppressed weeds in the voids and this gave peanut the potential to compensate for the skippy stand. However, no combination of herbicides sufficiently controlled weeds when peanut had 60 cm skips and peanut yields were consistently reduced.

On-going companion trials since 2011 are using these results to provide additional guidance on whether to replant a skippy stand, off-set supplemental plant, or leave the skippy peanut stand. The same protocol was used to create a skippy stand with 30 cm and 60 cm skips, each with herbicides programs built around residual herbicides or postemergence herbicides. Preliminary data suggests completely replanting peanut with 60 cm skips is necessary, since off-set supplemental planting does not allow peanut yield potential to fully recover compared to a complete replant. Residual herbicides for weed control helped peanut with 30 cm skips achieve yield potential and neither off-set supplemental planting nor complete replant were necessary.