

# Evaluation of Extension Agents' Sustainable Cotton Training Needs Using the Ranked Discrepancy Model (RDM)

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## 01. Introduction

Cotton production requires intensive chemical inputs (USDA National Agriculture Statistics Service, 2021) and impacts at least four major aquifers in the West-Central region (US Geologic Survey, 2021). Sustainable production practices can significantly reduce inputs and associated costs, increase farmer income, and lead to more efficient use of resources (Imran et al., 2018). As change agents (Ganpat et al., 2016; Strong & Israel, 2009), county agents are responsible for disseminating new practices to agricultural producers. The *National Research Agenda* highlighted the need to understand new practices for the development and implementation of sustainable agricultural systems (Lindner et al., 2016).

## 02. Conceptual Framework

Narine and Harder (2021) proposed the Ranked Discrepancy Model (RDM) versus the Borich model (1980) to assess training needs of a sample when: “(a) the census of a target population [is being evaluated] at one point in time, (b) data for each variable or item is paired on two ordinal scales with an equivalent number of response anchors, and (c) the objective is to assess discrepancies between two clearly identified states or conditions for each item” (Narine & Harder, 2021, p. 98).

The purpose of the study was to examine agents’ perceived proficiency and sense of importance in seven sustainable cotton production competencies. The objectives were to describe current competency levels of extension personnel and identify and rank discrepancies.

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## 03. Methodology



## 04. Results

After applying weights to NR (-1), PR (1), and TR (0), the RDM illustrated discrepancies in each competency from the point of equilibrium (0) for the forty (N = 40) respondents. Organic cotton production yielded the highest negative rank (NR = 3, PR = 2, TR = 27) competency (see Table 1).

Table 1.

*Ranks and Ranked Discrepancy Scores of Sustainable Cotton Production Competencies*

Competency	Ranks			
	NR	PR	TR	RDS*
Organic Cotton Production	3	2	27	-.41
Integrated Pest Management	4	4	32	.03
Proficiency of Soil Types in Your Area	8	9	23	.14
Fiber Quality and Post-harvest	6	10	25	.19
Applied Research	4	8	28	.21
Other Chemical Applications	7	13	20	.32
Water Management	5	14	21	.41

\*Note. RDS = Ranked Discrepancy Score

## 05. Conclusions

The use of RDM allows one to see the severity of a need and allows for direct comparison and priority ranking between competencies. While agents reported overall positive scores in integrated pest management, proficiency of soil types, fiber quality and post-harvest, applied research, other chemical applications, and water management, the data indicated agents need professional development respective to organic cotton production.

## 06. Future Research

The identified discrepancy will be used to develop training opportunities for agents. Further studies are needed to better understand the impact of specific items within competencies to understand their final analysis impact and the plausibility of competency discrepancies. Professional development in sustainable cotton production will assist agents to improve program impact (Benge et al., 2011) for cotton stakeholders and to decrease negative impacts on farmer income and natural resources (Lee et al., 2021).

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