Table 3. LOGIC MODEL for Western Region IPM Competitive Grant Project (Ellsworth et al.)

SITUATION	INPUTS	OUTPUTS		OUTCOMES – IMPACT		
What is the need?	***What we invest***	***What we do***	***Who we reach***	***What the short term results are***	***What the medium term results are***	***What the ultimate impact(s) is***
(1) To advance the science and implementation of bio-based IPM. (2) To improve knowledge of the roles of specific natural enemies (NE) in whitefly (WF) population dynamics and control in southwest desert agroecosystems. (3) To develop thresholds and sampling methods that integrate NE info into IPM decision making for WF control in cotton. (4) To educate growers and pest control advisors (PCAs) and to promote adoption of NE considerations into their WF IPM practices. (5) To better understand practical issues from stakeholder's perspectives that may affect adoption by end-users.	Time of researchers, grad student, Assistant in Extension, and IPM Program Manager to conduct research, outreach and project evaluation. Grant funds will support labor costs, but are highly leveraged w/ other resources, including Extension IPM funding, Western IPM Center Publications and work group grants & AZ Dept. of Ag grant that supplement outreach activities, and Cotton Inc. and AZ Cotton Growers grants that supplement research efforts. Improved infrastructure of the Arizona Pest Management Center, including 2 new County Agents and an Assistant in Extension involved in project outreach.	(1) Conduct large-scale replicated field research to quantify the role of specific NEs in WF control in cotton. (2) Develop, test and field demonstrate new thresholds that integrate NE role on WF populations. Work will be coordinated with local growers and partially conducted in grower fields. (3) Conduct outreach to end-users, including workshops, presentations, advisories, publications, participatory research and a new NE pocket guide. (4) Conduct a survey and live stakeholder sessions to measure clientele knowledge / practices, solicit input on new thresholds and sampling methods, including potential barriers to adoption.	Growers, pest control advisors (PCAs), agro-industry personnel & fellow extension scientists, IPM professionals and other researchers interested in adopting similar approaches in their cropping systems	An improved quantitative understanding of the role of NE populations in WF population dynamics in our system. PCAs and growers will gain knowledge of the diversity and function of NEs in cotton and related agro-ecosystems and will improve NE identification skills.	With cooperating growers and PCAs, we will develop, test and demonstrate the new thresholds and sampling methods in large-scale field trials, including work in grower's fields, and educate potential adopters. We will develop and deploy a coordinated outreach program and measure its impact on clientele intention to adopt the new approaches. We will also gain their input to help develop the most effective outreach tools, and to understand potential barriers to adoption of new thresholds and sampling methods.	Clientele will adopt new thresholds that factor in the role of NEs in WF control. This will lead to a reduction in broad-spectrum insecticide use and increased use of reduced risk strategies. New practices will reduce risks to human health and the environment and boost economic returns for growers, and increase ecosystem services. More significantly, we will have demonstrated scientific and practical validity of biological based IPM and its real world implementation by end-users. We hope to influence scientific peers to spur similar advancements in IPM elsewhere.