Logic Model: Predicting and Managing Invasiveness of the Q Biotype of the Sweetpotato Whitefly

SITUATION	INPUTS	OUTPUTS		OUTCOMES – IMPACT		
		Activities	Participation	Short	Medium	Long Term
What is the problem or need? The sweetpotato whitefly, *Bemisia tabaci*, is one of the world's most serious crop pests. An invasive new biotype of this pest, the Q biotype, was first reported in Arizona in December 2004. This pest represents a serious threat to crop production in Arizona and other states. We will conduct research to understand factors that affect the establishment and spread of the Q biotype. This data will aid in developing effective monitoring and prevention efforts for this invasive pest.	*What we invest* We are requesting $4000 to partially cover the salary of David Crowder, who is currently a graduate student but will be a postdoctoral associate beginning in August. We are requesting $6000 to partially cover research expenditures. This money will be used as follows: $1000 for PCR supplies; $1000 for greenhouse supplies and equipment; $1000 for equipment used in experiments; $3000 for maintenance of whitefly colonies.	*What we do* We will conduct experiments to understand factors that could affect the establishment and spread of the Q biotype: 1) Measure key life history traits of the Q biotype 2) Measure the impact of competition with the B biotype 3) Determine if insecticide resistance affects competition and life history traits 4) Create simulation models to determine the importance of these key factors on the potential establishment and spread of the Q biotype	*Who we reach* Our intended audience is extension personnel, county agents, and growers in Arizona. The overall goal of our activities is to work with these individuals to develop effective strategies to prevent the establishment and spread of the Q biotype, and to manage the Q biotype if it invades field crops.	*What the short term results are* 1) Understand key factors affecting the establishment and spread of the Q biotype 2) Aid in the development of monitoring and prevention efforts for the Q biotype 3) Analyze the potential outcome of invasions under approximated field conditions. 4) Predict the conditions under which invasions are most likely to occur in Arizona and other parts of the US.	*What the medium term results are* 1) Develop models with collaborators from Spain and Israel. These models will not only analyze but also *predict* the distribution and spread of the Q biotype in Spain and Israel. 2) Using geographical information systems (GIS), and data collected during earlier stages of the project, we will identify regions in Arizona most at risk of invasion.	*What the ultimate impact(s) is* 1) Expand GIS analysis to states other than Arizona to identify regions throughout the US most at risk of invasion 2) Improve and refine monitoring and prevention efforts for the Q biotype 3) Develop IPM strategies for the Q biotype if field crops are invaded *4)* Demonstration of an approach that might be useful in testing, predicting, and managing invasiveness in other pest systems