The IR-4 Project
Pest Management Solutions for Specialty Crops and Minor Uses

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Translating Innovation to Impact in Vector Control

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Efforts to encourage innovation in vector control have been motivated for the last decade by the rapid expansion of vectors and vector-borne diseases around the world, spreading resistance to existing chemical control tools, and a belief that eradication of some of these diseases may be possible with an adequate toolbox. The Innovative Vector Control Consortium (IVCC), the Deployed War Fighter Protection (DWFP) Program, and the IR-4 Public Health Pesticides Program have all encouraged research and development, and the range of potential control measures for public health pests has probably never been greater. However, few of the new ideas promoted by these initiatives have yet entered the operational toolbox, and attention has recently shifted to translating innovation to impact.

Innovation in vector control has been seen in three broad areas – reformulating existing Active Ingredients (AI's) into new products for public health uses, developing new product types (e.g. attract- and-kill products or area-wide repellents), and identifying new compounds with novel modes of action – but in all three, there is a critical need for new high-impact products.

New products based on existing AI's and new product types have begun to enter the market, but their impact on public health has been limited so far. For example, products based on previously unused pyrethroids (etofenprox, deltamethrin) have been introduced in the US for wide-area mosquito control, and these look promising, but as other pyrethoids have lost registration in the same period, their net impact is unclear. In addition, clothing treatment with pyrethroids other than permethrin is being evaluated, and new household and pet products enter the market frequently, so other reformulations seem likely in developed markets. For malaria control, long-lasting indoor residual sprays based on deltamethrin and pirimiphos-methyl, and new bed nets with combinations of AI's have generated enthusiasm. These new formulations can represent real improvements for users, but all of these products use traditional chemical classes, and resistance will probably limit their life span. Promising new product types, including ovitraps, attractive toxic sugar baits, etc., have been discussed previously in this series of articles, and are starting to sell, but so far represent a very small part of the market.

New AI's used exclusively for vector control would be highly desirable for resistance management, but the need for at least two new modes of action to inhibit resistance, and the large cost of developing and registering each novel chemical class, have appeared to be insurmountable challenges. However, an IVCC effort to screen millions of chemicals in company libraries for mosquito control efficacy has apparently paid off, and it looks likely that new AI's in novel classes could start the registration process in the next year. If funding is sufficient, the goal is to restrict these new chemicals to the vector control market, hopefully ensuring their utility for decades.

While support for vector control innovation has been fruitful, and the potential for many new chemicals, product types, and products is great, operational impacts will require that the pipeline from idea to market flows smoothly and quickly. Thus, the current focus in public health pesticides is on addressing the critical paths needed to ensure rapid product develop- ment, evaluation, registration, and procurement.

Towards this end, IR-4 has been working with a new joint initiative known as I2I (Innovation "2" Impact), led by the Gates Foundation, that is intended to promote a more efficient approval process for new vector control materials and products. A meeting in London in June highlighted key elements of the plan: A restructuring of the WHO Pesticide Evaluation Scheme to speed-up their evaluation and recom- mendation process; development of a network of GLP test facilities in malaria-endemic areas to support reliable efficacy testing by manufacturers; global joint review with a common data dossier for each new material; revisions to procurement methods to ensure high quality products reach the market; a review of the technical basis for determining that products are equivalent in efficacy; development of a similar pathway to global approval for new product classes; and continued investment in early-stage innovation. IR-4's long experience in helping move good ideas in pest management towards registered end-use products in small markets should be helpful, and we expect to play a major role in vector control innovation for years to come.