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

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Community-based Control of Ticks and Tick-borne Diseases

— by Karl Malamud-Roam, IR-4 Public Health Pesticide Manager

After decades of being overshadowed by mosquitoes in discussions of blood-suckers, ticks have gained recent prominence, largely because of the spread of Lyme Disease, which is now the most common vector-borne disease in the US However, while patients' advocates and the media have focused significant attention in recent years to the harm caused by tick bites and the pathogens they can carry, organized efforts to control ticks and tick-borne diseases are still uncommon and poorly funded, lagging far behind the mosquito control community by almost any measure of activity or outcome. There are a number of reasons that prevention of tick-borne diseases has been seen as the responsibility of families and individuals, rather than local governments or other community-based programs, but there are signs that this tradition is beginning to change, and IR-4 is a key player in this shift.

While mosquitoes fly and buzz and generally cause a nuisance even when they are not making you truly ill, the same is not true for ticks, which are more stealthy as they search for blood meals to help develop their broods. This means that an early motivation for organized mosquito control programs – to allow outdoor recreation and protect tourism and property values from highly visible pests – had little parallel when the pest was small and silent and generally painless. The other motivation for committed mosquito control – to prevent vector-borne diseases – was also unlikely to inspire tax-payers to focus on ticks, as tick-borne diseases like Rocky Mountain Spotted Fever were generally seen as rare and remote. The fact that mosquitoes could fly across property lines also inspired community-wide programs, as good sanitation on your own property was not enough to protect you; ticks, in contrast seem pretty immobile, and the perception has been wide-spread that they could be easily avoided with some planning and perhaps the application of repellents.

It seems that two primary factors have led the public health community, and vector control specialists in general, to rethink the old paradigm that mosquitoes might be a community problem, but tick problems could be effectively dealt with by individuals and families. First was the increasing awareness that the old approaches to ticks and tick-born diseases weren't working – 10,000 cases of Lyme Disease rising to at least 30,000 each year with no end in sight, and no clear cure, simply could not be ignored. This was especially true as other tick-borne diseases (babesiosis, anaplasmosis, ehrlichiosis, etc.) were increasingly associated with significant mortality. At the same time, it was critical to prove that community-based or area-wide control programs could do better. The first evidence for this actually came from veterinary medicine, where control of cattle ticks and their associated diseases were only effective when area-wide programs were implemented. From 1997- 2002, ARS scientists led an experimental area-wide control program against black-legged ticks by treating dear with acaricides; while results were promising, implementation was challenging and has spread slowly. Since then, small scale demonstration projects have

shown variable degrees of success with both pesticide and non-pesticide community-based activities, such as deer population management, improved forest trail maintenance, land-use planning to reduce human contact with ticks, and social marketing to encourage greater use of repellents. None of these has been the silver bullet, and, as with mosquito control, it increasingly appears that careful use of conventional pesticides (e.g. bifenthrin) and botanicals (e.g. nooknatone), based on careful surveillance and integrated with non-pesticide tools, will be an essential component of effective tick-borne disease control.

During the last year, the momentum for community- based control of ticks and tick-borne diseases has increased substantially, and the IR-4 Public Health Pesticides Program has been substantially involved. In March 2011 we helped sponsor a national conference on "IPM for Preventing Tick-Borne Diseases" and led the session on community-based tick control programs. We are now a key partner in the federal Tick-Borne Diseases Integrated Pest Management Subgroup, which is drafting a white paper on practices to recommend and recommendations for research and funding.

Finally, IR-4 is preparing an inventory of all pesticides that are labeled anywhere in the world for tick control, as one critical step to identify best practices that communities can use to protect themselves.

Deer tick or black-legged tick, *Ixodes scapularis* (photo credit Oklahoma State U.)