

Managing Mosquitoes



Standing water created a habitat for mosquitoes on the golf course

fix the standing water issues so we had to manage this problem from the back end," said Pam Smith, Director of Agronomy at the Harvard Gulch Golf Course.

Location: **Denver, Colorado, USA**
Type of property: **Public, 9-hole golf course**
Type of membership: **ACSP for Golf**
Member Since: **2008**
Certified Since: **2015**

They Found A Home

Ordinarily, mosquitoes are not an issue in the dry, high plains climate. However, overgrown and unmanaged urban storm water features were creating standing water and became a host to mosquito larvae and adults. The ditches in the problem areas had 20-foot tall trees and cattail vegetation. All the vegetation and 30 years of sediment caused many pockets of standing water. "We needed to work through the political, social, and functional aspects of mosquito control for this area. We were not getting support from other agencies to

First Steps

After a vegetation removal project in the area in 2013, the course experienced fewer standing pockets of water in rain events. They kept these areas trimmed to reduce the adult habitat of mosquitoes; however, there was just too much vegetation to be properly controlled. They added a dry vegetation burn, with a scheduled burn in spring and fall of each year. The course continued this management along with applying *Bacillus thuringiensis israelensis* (Bti), a biological control for certain species of insect that is safe for humans and other creatures.

Results

After the 2013 Bti applications and burning, they experienced a marked difference from 2012 adult populations. 2013 overall had fewer customer and neighborhood complaints on mosquitoes. "Generally we had excellent control over adult mosquito populations. We went most of the season without the complaints that we had from 2012. However, we experienced a severe adult outbreak after a significant rain event. It took us about 1 month to regain control of larvae and adult reductions," said Pam. Overall, the staff proudly reported that they did not have the terrible infestations that occurred in 2012. Regarding public perception, most of the golfer comments and questions occurred when monitoring and treatments were performed. Night golf participants were most inquisitive due to the intensity of mosquitos at that time.

Lessons Learned: Consistent Monitoring in Key

Overall using a combination of non-toxic larvicide and vegetation control can be effective in combating mosquitos. Lessons learned:

- A breakthrough of infestation occurred in the summer when large amounts of storm water washed out existing Bti treatments. Don't stick to your weekly schedule if you have a rain event; be sure to re-treat with Bti after every significant rain event.
- Test your larvicide, and test it often. Mosquitos should be dead by the next day if the larvicide is effective.
- If you have bad areas, treat, and come back within 72 hours to see if you had success. Don't wait a full week.