

A Climate for Immigrants

Dr. Frank Krell, DRS Guest Speaker, March 2017

By Susan Wroble

Denver Rose Society's March meeting featured Dr. Frank Krell, Curator of Entomology at the Denver Museum of Nature and Science. A specialist in scarab beetles, Dr. Krell received his doctorate from the University of Tübingen, Germany.



Dr. Krell pointed out that humans have transformed the landscape of Colorado's front range to make a warm and welcoming environment for immigrants. In this case, the immigrants in question are Japanese beetles.

In the United States, Japanese beetles were first discovered in the summer of 1916 in a plant nursery in New Jersey. They had likely come in a few years earlier with Japanese irises. Dr. Krell explained that it took the beetles twenty years for them to extend to nearby states, but by the 1950s, the spread had become explosive. In Colorado, a single specimen was found in 1991, and after 1995, specimens were found each year, indicating an established population. Interestingly, the fact that the beetles are not found in western Kansas indicates that they did not migrate across the country, and were instead likely brought in with plant material.

Life Cycle:

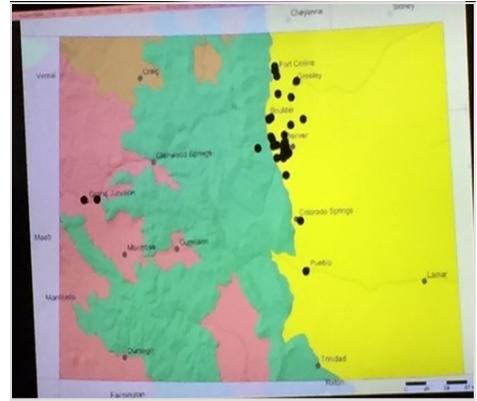
Those beautiful metallic green beetles with bronze wings that destroy our roses – and feed on about three hundred other plants – are the adult stage of a year-long life cycle. Once adult Japanese beetles mate, typically in late spring or early summer, the female drops to the turf, burrows a few inches underground, and lays a few eggs. The process is repeated until she has laid about fifty eggs. A few weeks later, the eggs hatch. The grubs begin to feed. Their preferred food is, as Dr. Krell said, “Nice juicy grass roots. Japanese beetles really don't like it dry,” he continued, “They would die of desperation and desiccation in western Kansas!”

The irrigated lawns that stretch from Pueblo to Fort Collins provide a perfect environment for Japanese beetle larvae. The white grubs grow to about an inch long, and are curled into a “C” shape. In late autumn, the grubs burrow further down into the soil, and remain inactive through the winter months. In all, they spend about ten months of the year in the ground. In late spring, they pupate, emerging about two weeks later as adults.

Eradication:

On Colorado's Western Slope, the town of Palisade successfully fought off the invaders. Japanese beetles were first identified by a master gardener in Palisade in 2002, although they had likely been around the area for a few years prior. In 2003, citizens formed a Japanese beetle Advisory Committee. Dr. Krell described an information and education campaign followed by an eradication drive. In 2004 and 2005, more than 700 properties – nearly all the irrigated areas within the city limits – were treated with insecticide. The remaining properties allowed their grass to dry out. In subsequent years, treatment was confined to hot spot areas. By 2009, no Japanese beetles were caught in the traps.

Dr. Krell noted that while the experience in Palisade shows that eradication is possible, it can't be replicated along the Front Range. Palisade is small – about one and a quarter square miles, with less than three thousand inhabitants. And it is the center of fruit production in Colorado, known for its peaches and its wine. Palisade's citizens had a compelling economic interest in wiping out the pest. In contrast, the Front Range has millions of inhabitants and no unifying economic interest.



Dr. Krell: Japanese beetles found in Colorado

Lures and Prevention:

In its natural state, Colorado was not a suitable habitat for the Japanese beetle. The Plains Conservation Center in Aurora, where Dr. Krell studies dung beetles, allows us to see the stark contrast between the native environment of grasslands and the human-engineered environment of lawns. Japanese beetle larvae feed on the underground roots of plants, with a preference for turf grass. Colorado's Front Range provides that in abundance.

Dr. Krell said that most of the commercially available Japanese beetle traps use a two-pronged approach to attract the beetles: a combination of pheromone and floral lure. Unfortunately, if one individual homeowner is setting a trap, the plan may back-fire, bringing in even more beetles to the area.

A better solution for rose growers may be to change their environment, making it less welcoming for the immigrants. This may mean eliminating lawn areas, or replacing them with xeric grasses. These grasses can withstand a period of drought in the summer when the young larvae are most vulnerable. In wetter summers, however, the xeric approach will not work.

“There is no real biological specific control agent for Japanese beetles,” Dr. Krell pointed out, “apart from soil nematodes.” Nematodes, or microscopic roundworms, are a diverse phylum, and there are nematodes sold for Japanese beetle control. “Nematodes are probably the only way to fight them biologically,” Dr. Krell said, “but I don't know how effective they are.” The Colorado Department of Agriculture relied on chemicals, and not nematodes, for the Palisade eradication.

For DRS members, it looks like we are in for a summer of hand collection. If you want to kill the beetles as humanely as possible, Dr. Krell recommends sticking them in a bag in your freezer for two weeks before throwing them out. I'm picturing it now. Ice cream and beetles, anyone?