

disparities in the intensity of competition. Here we examine these issues for the Argentine ant (*Linepithema humile*) and the red imported fire ant (*Solenopsis invicta*). Compared to native populations of Argentine ants, introduced populations less often exhibit intraspecific aggression. The loss of intraspecific aggression may help explain the Argentine ant's success. In California, we have observed abrupt and well-defined behavioral boundaries at 16 contact zones between three different pairs of supercolonies. We visited 9 of these zones weekly during a six-month period and observed consistent and intense intercolony aggression that resulted in variable, but often large, levels of worker mortality. A close correlation exists between behavioral and genetic variation: ants within the same supercolony did not fight with one another and had low levels of genetic differentiation, whereas ants from different supercolonies always fought and had relatively high levels of genetic differentiation. Our results illustrate in principal how reduced intraspecific aggression may enhance ecological success. Regional differences in interspecific competition may also contribute to ecological success. To learn more about these disparities, we investigated competition between *L. humile* and *S. invicta* at two sites in northern Argentina. Baiting surveys revealed that neither *S. invicta* nor *L. humile* achieves the same degree of behavioral or ecological dominance in areas where either is common in its introduced range. Moreover, reciprocal colony-removal experiments illustrated that *S. invicta* and *L. humile* experience comparable levels competitive release. These results strongly suggest that interspecific competition is an important limiting factor for both *S. invicta* and *L. humile* in South America.

220 - FIRE ANT BIOLOGY, ECOLOGY AND BIOCONTROL

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The red fire ant *Solenopsis invicta* was accidentally introduced into the United States from South America sometime in the 1930s. These ants do best in open, disturbed habitats associated with human activities. Fire ants construct large earthen mounds which function as solar collecting devices. Fire ants function as primary consumers, predators, and scavengers. Adult workers rely on sugar solutions from plants for metabolic fuel while larvae require arthropod prey for growth. Fire ants use a network of branching foraging tunnels to collect their food. Mature fire ant colonies average between 100,000 and 200,000 workers. Colonies live about seven years. Fire ants use pheromones and other chemicals to recruit workers, signal alarm, recognize nestmates, control development of sexuals, and regulate queen oviposition. Fire ant populations in North America are 5-10 times higher than native populations in South America, apparently because they have escaped many of their natural enemies. The introduction of self-sustaining natural enemies offers the only real hope for permanent wide-area control of imported fire ants. To date, three decapitating flies in the genus *Pseudacteon* have been released as classical biocontrol agents of imported fire ants. A fourth species is awaiting release permits and a fifth species is awaiting host specificity tests in quarantine. Host-specificity tests are being conducted with two microsporidian pathogens from Argentina in an effort to clear them for field release in the United States. Several viruses, a parasitic ant, a parasitic wasp, and several nematodes are also being investigated as potential biocontrol agents. Ultimately, it is hoped that the introduction of these and other biocontrol agents will tip the ecological balance back in favor of our native ants. If this happens, imported fire ant populations in North America may drop to levels similar to those in South America.

221 - IMPORTED FIRE ANT: ECONOMIC IMPACTS JUSTIFYING INTEGRATED PEST MANAGEMENT PROGRAMS

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The red imported fire ant, *Solenopsis invicta* Buren (Hymenoptera: Formicidae), the black imported fire ant, *S. richteri* Forel, and their hybrid are major exotic pest ants in 14 southern United States and territories, with *S. invicta* recently detected in parts of Australia, Taiwan, China and Mexico. There are large social and medical costs associated with this pest. The tall mounds they build in the landscape average 60 mounds per acre (148.2 per hectare) from Louisiana eastward, and 300 mounds per acre (741.0 mounds per hectare) in areas of Texas and elsewhere infested with the multiple queen or polygynous form. Recent surveys conducted by Agricultural