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DAMAGE TO NORTH CAROLINA AND FLORIDA HIGHWAYS BY RED IMPORTED FIRE ANTS (HYMENOPTERA: FORMICIDAE)

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The increasing importance of the red and black imported fire ants, *Solenopsis invicta* Buren and *S. richteri* Forel as economic pests is documented in reviews (Lofgren 1986, Adams 1986) and bibliographic lists (Banks et al. 1978, Wojcik & Lofgren 1982, and Wojcik 1986). This report of damage by red imported fire ants (RIFA) to highways in North Carolina and Florida further emphasizes their pestiferous nature.

Depressions or potholes (2.5-15 cm deep and up to 1.4 m long and 45 cm wide), adjacent to RIFA mounds, were observed in three highways in Onslow Co., NC (CDR. Roger Grothaus, U. S. Naval Medical Field Laboratory, Camp Lejeune, NC—personal communication). Investigation by one of the authors (CTA) revealed that removal of soil from beneath the roadway by RIFA caused the road to collapse under vehicular traffic. The larger depressions were hazardous to vehicles and all caused sufficient breakup of the asphalt surface to require repairs.

The North Carolina Department of Transportation (NCDOT) indicated that proper repair of the damage required removal of the asphalt over the area excavated by the ants, replacement and repacking of the roadbed, and repaving. Repair costs averaged \$200 per depression.

Forty km along the three roads averaged four depressions or potholes per km. Although no other roads were damaged, the presence of numerous fire ant mounds indicated the potential for additional depressions unless the ants were controlled.

NCDOT reported that ant excavation appeared more frequent during the colder months. We suspect that this behavior resulted from the ants seeking the warmth absorbed by the highway from the sun's rays.

In Florida, damage by RIFA to the expansion joint sealant (Dow Corning® 888 silicone highway joint sealant—Dow Corning Corporation, Midland, MI. 48640) between newly-completed concrete sections of Interstate Highway 75 near Tampa was detected by Florida Department of Transportation (FLDOT) personnel. Open tunnels (approximately 1.25 X 7.5 cm) underneath the sealant, extending laterally across the highway from shoulder to shoulder and longitudinally along the traffic lanes, were invaded by RIFA from nests on either shoulder. Damage occurred as the ants chewed away a styrofoam backer rod and made exit holes through the silicone to the surface. Backer rod and cured silicone exposed to ants in laboratory colonies was chewed, but neither material was particularly attractive to the ants.

Damage by the ants is important because expansion joints in concrete highway must be tightly sealed, with material pliable enough to withstand concrete contraction and expansion, against rainwater entry. The silicone provides a better and much longer lasting seal than the tar that is usually used.

Although ant penetration of the sealant appeared to be random, about twice as many holes were found in sealant in lateral joints as in longitudinal joints. We found 226 holes, ranging in size from about 1.0 to 50 mm, in a total of 2820 m of sealant at 12 randomly selected sites near the junction of I-75 and FL-574. Penetration of all the sealant by RIFA at this observed frequency would give a total of about 555 penetrations in the 6930 m of sealant in each km of highway.

Repair or replacement of the RIFA-damaged sealant was required for release of Federal highway funds to FLDOT. Replacement costs were approximately \$45,100 per km, thus, FLDOT chose to repair the damage with a patch of silicone over each ant penetration. Repairs cost an estimated \$82 to \$187 per km.

Continuing damage to the sealant was prevented by application of Amdro® Fire Ant Bait (1.12 kg/ha) to the highway median and shoulders. Initial control costs were ca \$28 per km for material and labor. RIFA reinfestation of the highway right-of-way has required twice yearly retreatment with Amdro at an increased annual highway maintenance cost of approximately \$56 per km.

Damage to highways in the United States by other ant species has not been reported, however, no other ant species are as wide-spread and abundant as RIFA. We have observed only one other instance of damage by RIFA to highways; potholes like those observed in NC were found adjacent to RIFA mounds along asphalt roads at the Martin Co., Florida electric power plant. Nevertheless, highway engineers and maintenance personnel need to be aware that RIFA can cause serious damage and should take steps to prevent damage and associated repair costs.

Mention of a proprietary product does not constitute an endorsement or a recommendation by the USDA for its use.

REFERENCES CITED

- ADAMS, C. T. 1986. Agricultural and medical impact of the imported fire ants, pp. 48-57, in C. S. Lofgren and R. K. Vander Meer [eds.], *Fire ants and leaf-cutting ants: biology and management*. Westview, Boulder, CO. 435 pp.
- BANKS, W. A., C. S. LOFGREN, AND D. P. WOJCIK. 1978. A bibliography of imported fire ants and the chemicals and methods used for their control. USDA, Agric. Res. Serv. ARS-S-180. 35 pp.
- LOFGREN, C. S. 1986. History of imported fire ants in the United States, pp. 36-47, in C. S. Lofgren and R. K. Vander Meer [eds.], *Fire ants and leaf-cutting ants: biology and management*. Westview, Boulder, CO. 435 pp.
- WOJCIK, D. P. 1986. Bibliography of imported fire ants and their control: second supplement. *Florida Entomol.* 69: 394-415.
- WOJCIK, D. P., AND C. S. LOFGREN. 1982. Bibliography of imported fire ants and their control: first supplement. *Bull. Entomol. Soc. Am.* 28: 269-276.