

## RED IMPORTED FIRE ANT INVASION OF FALLOW RICE FIELDS

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The red imported fire ant, *Solenopsis invicta* Buren (Hymenoptera: Formicidae) is an introduced species in the southeastern United States. It has spread through Texas since the 1950's and despite eradication attempts, has become widely established in the eastern half of the state. Fire ant population densities appear to become somewhat stable in undisturbed areas such as the Attwater Prairie Chicken National Wildlife Refuge in Colorado County, where fire ant mound numbers averaged 49 per acre (ranging from 40 to 90) over a 3 year period (1991-1993). In land disturbed by flooding, agriculture, construction or insecticide use, ants re-invade quickly, often to higher colony densities than they were before disturbance. This census of fire ant mound densities in fallow rice fields was undertaken to provide documentation of fire ant re-invasion of disturbed habitats.

### Methods and Materials

Rice production in Texas is characterized by fields being permanently flooded through the summer months and then being drained for harvest during August through November. Fallow rice fields, which had been planted to rice and flooded during the summer 0.5, 1.5 and 2.5 years prior to surveying were selected (These fields were planted to rice in 1992, 1991 or 1990, respectively). Four sets each of fallow rice fields were surveyed in February 1993. Within each field, six 0.5 acre circular areas, selected as to avoid field margins and levees, were monitored for the presence of active fire ant mounds and the presence of reproductive larvae and pupae. Resulting mound numbers were analyzed using regression analysis and the Student's *t* test ( $P \leq 0.05$ ).

### Results and Discussion

No red imported fire ant mounds were found in fields planted to rice the previous summer (Table 1). In 1.5 year fallow rice fields (1991), ant mounds averaged 45 per acre (ranging from 12 to 92) and in fields planted to rice 2.5 years earlier (1990), an average of 74 mounds per acre (ranging from 28 to 202) was detected. A significant linear regression ( $F = 97.695$ ;  $P = 0.0001$ ; d.f = 70) was found between the appearance of mounds over time:  $Y = 18.52X + -17.319$ , where  $Y$  = ant mound density and  $X$  = time (years, rounded off). The number of plots in which reproductive brood was detected also increased over time, with 8 plots in 1991 planted rice fields (1.5 years) and 18 plots in 1990 planted rice fields (2.5 years).

Results of this fire ant mound census provide documentation of fire ants re-invading an area cleared of ants by flooding in rice culture. Ant mound densities in this disturbed habitat were shown to increase at a rate of 37 mounds per acre per year. Over a three-year period densities increased to 74 mounds per acre, exceeding densities in a stable habitat at a nearby wildlife refuge by 25 mounds per acre (34 percent).

**Table 1.** Number of red imported fire ants per 0.5 acre circle area in fallow rice fields, Colorado County, Texas 1993.

<u>Sample site</u>	No. fire ant mounds per 0.5 acre circular plot					<u>A-D</u>
	<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>		
<b>Planted to rice in 1992</b>						
1	0	0	0	0		
2	0	0	0	0		
3	0	0	0	0		
4	0	0	0	0		
5	0	0	0	0		
6	0	0	0	0		
Mean	0	0	0	0		0
<b>Planted to rice in 1991</b>						
1	28*	6*	46*	22		
2	40*	18	34	9		
3	25*	26*	26*	25		
4	12	24*	16	54		
5	10	25	13	19		
6	7	8	20	18		
Mean ± S.D.	20.3 ± 12.8	17.8 ± 8.9	27.5 ± 11.4	24.5 ± 15.4		22.5* ± 12.1
<b>Planted to rice in 1990</b>						
1	41*	15	27	32*		
2	24*	48*	52*	44*		
3	14	33*	29	48*		
4	22	42*	52*	30*		
5	20	41*	101*	23*		
6	38*	26*	65*	22*		
Mean ± S.D.	26.5 ± 10.7	34.2 ± 12.1	54.3 ± 27.1	33.2 ± 10.7		37.0* ± 18.8

\* Indicates means are significantly different according to the Student's *t* test ( $P \leq 0.05$ ; d.f. = 46;  $t = -3.1681$ ).