Effect of Irrigation on Turfgrass Damage Caused by Japanese Beetles

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On May 15, 1985 replicated plots were established at an Oakland County golf course heavily infested with Japanese beetle. Each plot was established by sinking metal edging to a depth of 6 inches in a square pattern. Japanese beetle grubs previously collected and stored were released into these square foot plots at a density of 0, 10, 20, or 30 grubs per square foot. One set of plots was located in an irrigated area close to the fairway. Another identical set of plots was located 30 feet away in non-irrigated rough. On June 20th, grass clippings were collected from all plots and grubs dug in two plots of each treatment to determine survivorship.

Data from these plots allow some tentative conclusions to be drawn about damage thresholds and irrigation. The number of Japanese beetle necessary to cause turf damage depends on the level of irrigation and plant health. In our research plots, the grass was healthier and the chlorophyl content greater in all irrigated plots compared to non-irrigated plots regardless of the number of grubs present (Fig. 1). Little visible damage was detectable in irrigated plots at grub densities of 10 or 20 per ft^2. Japanese beetle populations greater than 20 grubs per ft^2 seem capable of damaging even highly maintained turfgrass. Also, Japanese beetle larvae did not survive as well in drought stressed plots compared to irrigated plots (Table 1).

Table 1. Survival of Japanese beetle larvae during irrigation test from May 15 to June 20, 1985. Average percent larvae surviving in irrigated plots was 68.0, compared to 19.2 percent in non-irrigated plots.

Treatment	Irrigation	Larvae Added to each Plot	Number of Japanese Beetles Recovered			Percent Survival
			Larvae	Pupae	Adults	
1	Yes	10	9	0	1	100
1	Yes	10	5	0	0	50
2	Yes	20	19	0	0	95
2	Yes	20	12	0	0	60
3	Yes	30	6	0	0	20
3	Yes	30	22	2	1	83
4	No	10	1	0	0	10
4	No	10	1	0	0	10
5	No	20	5	2	0	35
5	No	20	4	0	0	20
6	No	30	3	0	0	10
6	No	30	9	0	0	30

Figure 1. Japanese beetle damage to irrigated and non-irrigated turfgrass. Damage is evaluated by chlorophyl content per gm of grass tissue. A chlorophyl absorption reading of 11.0 represents healthy green grass while a reading of 4.0 represents nearly dead, brown grass.