

YELLOW NUTSEDGE NUTLET PRODUCTION IN RESPONSE TO NUTLET PLANTING DEPTH

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Introduction

Yellow nutsedge has become a major problem weed in agricultural land in the Treasure Valley. Control of yellow nutsedge is difficult because reproduction is mainly by rhizomes and tubers (nutlets) and nutlet production is intense. Control of yellow nutsedge will partly rely on nutlet destruction by fumigation. Information on the depth at which most nutlets are produced and the maximum depth from which nutlets will emerge is essential for managing tillage and fumigation operations. This trial tested nutlet emergence, nutlet production, and depth of production for nutlets planted at different depths.

Materials and Methods

The experimental design was a randomized complete block with four replicates. The treatments were nine planting depths starting at 2 inches and increasing in 2-inch increments. Each plot consisted of a 10-inch-diameter PVC pipe, 24 inches long. The pipes were cut lengthwise on two opposing sides. The pipes were then reassembled by taping the cut sides. The pipes were arranged in two parallel rows with 18 pipes in each row. The pipes were placed in a trench and the trench was filled so the top of the pipes were at ground level. The pipes were filled with soil and then drip-irrigated for 30 minutes. Each pipe was irrigated with one emitter with a 1 gal/hour flow rate. On May 5, sprouted nutlets were collected from a field severely infested with yellow nutsedge. Two sprouted nutlets were planted at each pipe center, 3 inches apart at the treatment depth. Planting holes were made with a soil probe to the correct depth. After planting, the pipes were irrigated for 15 minutes. Thereafter the pipes were irrigated weekly to maintain soil moisture to a 2-ft depth. A total of 94.1 inches of water was applied from May 5 to the last irrigation on October 10.

On November 7, the pipes were dug up. Each pipe was opened along the pre-cut sides and the soil column was cut vertically in 2-inch increments. The nutlets from each 2-inch depth increment were separated by washing and sieving. The nutlets from each 2-inch depth increment were counted and weighed.

To calculate the average nutlet depth, the number of nutlets recovered from each soil depth increment were assigned the average depth of that soil depth treatment. The

number of nutlets recovered from the 0- to 2-inch depth in a pipe was multiplied by 1, the number of nutlets recovered from the 2- to 4-inch depth was multiplied by 3, etc.

Results and Discussion

Large numbers of nutlets were produced in each pipe. There was no significant difference between planting depths in the total number, total weight, average weight, and average depth of the nutlets produced (Table 1). On average, nutlets were produced at a 3.8-inch depth (Table 1). Below the 4- to 6-inch depth, nutlet production decreased sharply with increasing depth (Fig. 1).

The results show that regardless of the depth of nutlet emergence, new nutlets form mostly in the upper 6 inches of soil.

Table 1. Nutlet production and average depth of nutlets produced by yellow nutsedge plants originating from nutlets planted at nine depths. Malheur Experiment Station, Oregon State University, Ontario, OR.

Planting depth	Nutlets produced	Total nutlet weight	Average nutlet weight	Average depth of nutlets produced
inches	No./ ft ²	oz/ft ²	g	inches
2	2,067	9.80	0.14	3.64
4	1,896	9.33	0.14	3.66
6	2,050	9.63	0.14	3.88
8	2,316	12.54	0.15	4.26
10	2,001	10.89	0.16	3.66
12	1,802	9.65	0.15	3.83
14	1,523	8.65	0.16	4.08
16	1,694	8.60	0.15	4.10
18	1,421	7.54	0.15	3.15
average	1,863	9.63	0.15	3.81
LSD (0.05)	NS	NS	NS	NS

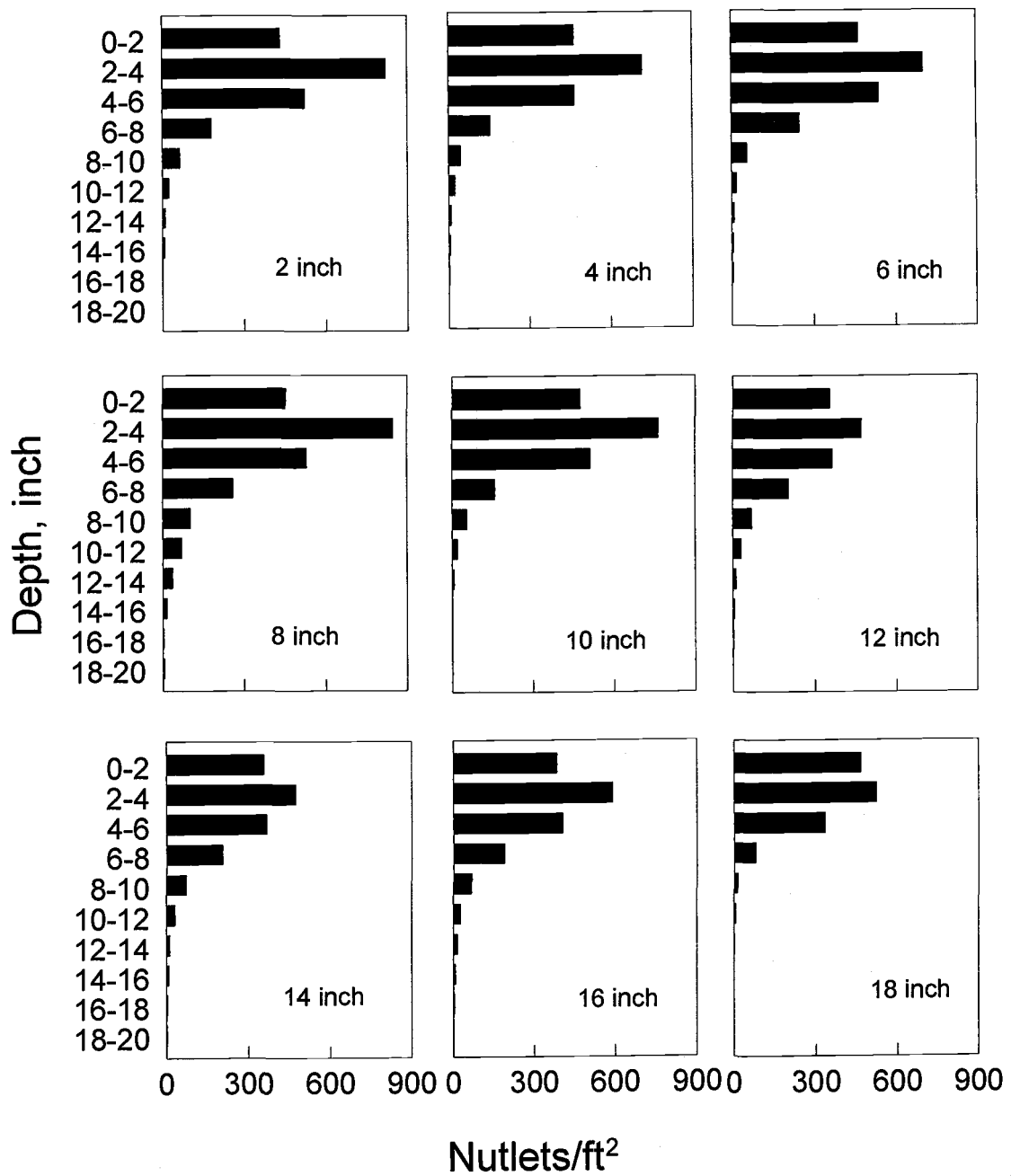


Figure 1. Distribution of yellow nutsedge nutlets by depth from nutlets planted at nine depths. Malheur Experiment Station, Oregon State University, Ontario, OR.