2023 INTER-ROW MOWING IN ORGANIC NO-TILL BLACK BEANS

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Dry beans

Table 2. Description of inter-row mowing treatments, 2023.

Treatments	

space. Once dry, the beans were threshed using a portable Almaco thresher with a rasp bar rotor. The beans were then weighed for plot yield. To assess differences in seed size, a 100-seed weight assessment was completed by counting out 100 seeds and recording the total seed weight for three samples per plot.

Data were analyzed using a general linear model procedure of SAS (SAS Institute, 1999). Replications were treated as random effects, and treatments were treated as fixed. Mean comparisons were made using the Least Significant Difference (LSD) procedure where the F-test was considered significant, at $p<0.10$. Variations in yield and quality can occur because of variations in genetics, soil, weather, and other growing conditions. Statistical analysis makes it possible to determine whether a difference among treatments is real or whether it might have occurred due to other variations in the field. At the bottom of each table an LSD value is presented for each variable (i.e. yield). Least Significant Differences (LSDs) at the 0.10 level of significance are shown. Where the difference between two treatments within a column is equal to or greater than the LSD value at the bottom of the column, you can be sure that for 9 out of 10 times, there is a real difference between the two treatments. In this example, treatment C is significantly different from treatment A but not from treatment B. The difference between C and B is equal to 1.5, which is .1growated as(nst)4(i)-4(

seeding rate. Overall black bean stands were good, with an average emergence population of 163,640 plants ac^{-1} which was above the target seeding rate of 150,000 seeds ac^{-1}. In August at the time of peak biomass,

DISCUSSION

For the 2022-2023 growing season, the UVM Northwest Crops & Soils Program conducted the first year of a research trial to determine if inter-row mowing can provide adequate weed management while minimizing damage to the organic no-till dry bean crop. Inter-row mowing early, late, and as-needed were compared to a control where no inter-row mowing occurred to understand how the timing of the weed management impacted black bean yields and weed biomass. The average rye biomass at termination was 9546 lbs or 4.8 tons ac^{-1}, resulting in a thick layer of cereal rye mulch. Black bean emergence was very good, and the average emergence population was 163,640 plants ac^{-1}, slightly above the target seeding rate of 150,000 plants ac^{-1}. Excessive moisture and cool temperatures resulted in smaller plants that never got large enough for complete canopy closure. The plants also did not have any vining earlier in the season. As a result, there was little to no damage to the plants after the Early and As-Needed weed control treatments. By early August, there was significant vining throughout the trial, and this caused a lot of damage to the plants in the Late weed control plots. Whole plant bean and weed biomass was measured about a week after the inter-row mowing occurred in the Late weed control treatment. However, there were no significant differences in whole plant biomass or weed biomass between treatments. The thick rye mulch and supplemental weed management with the inter-row mower kept weed pressure low throughout the trial. Black bean seed yields were significantly impacted by the timing of the inter-row mowing. The Early weed control had the greatest black bean yields, 3062 lbs ac^{-1} at 14% moisture. This was not statistically different from the No weed control indicating no negative impact from early mowing. Despite the damage resulting from the Late weed control treatment, black bean yields were not statistically different from the As-Needed or No weed control treatments. -row mower can be a valuable tool for weed management in an organic no-till system, but the timing of inter-row mowing is very important. There is a risk of inter-row mowing too late in the season once plants have approached canopy closure or if the plants have significant vining It is important to note that these data represent only one year of data at one location. The NWCS program is repeating this research trial again in the 2023-2024 season.

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