

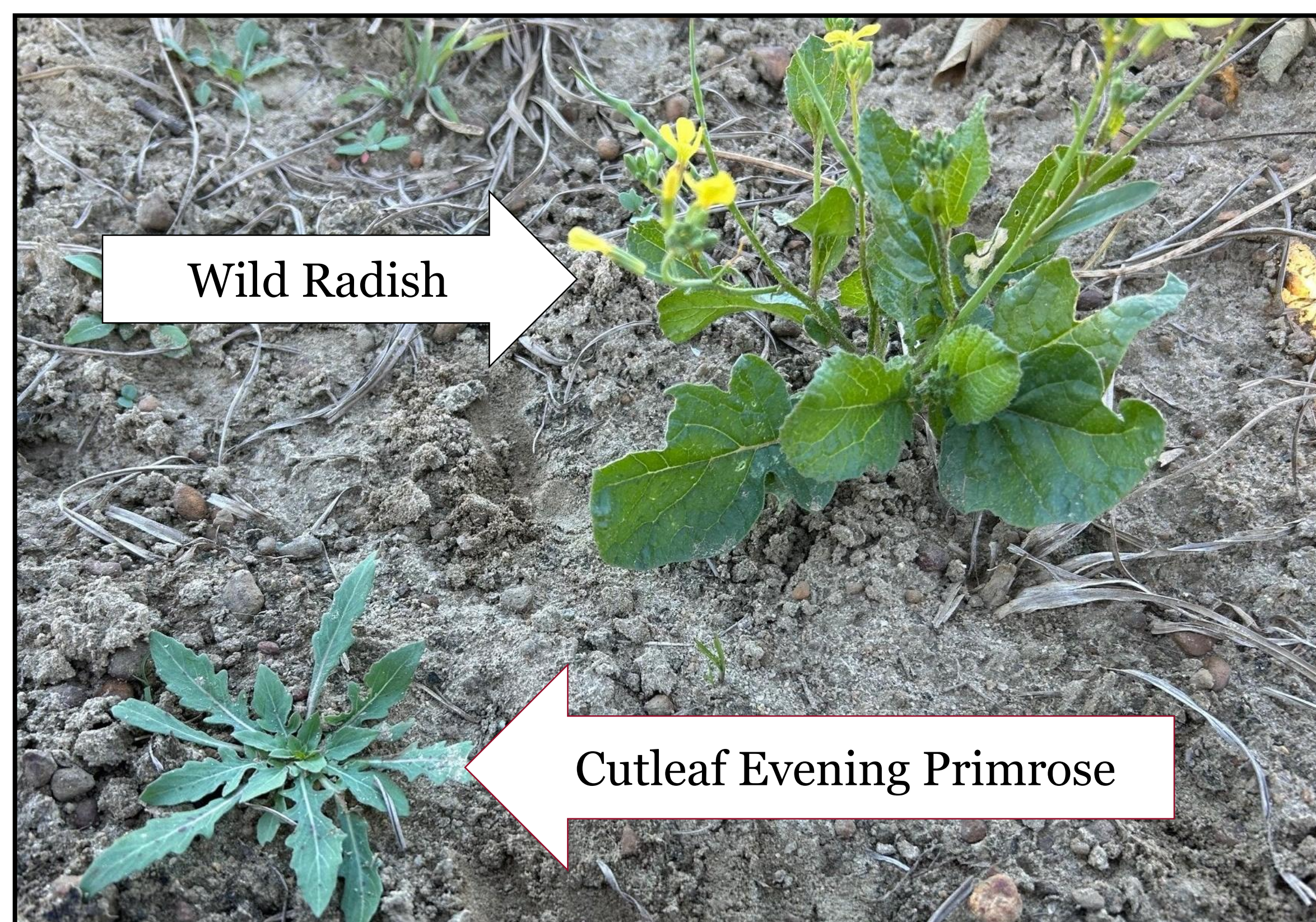
Evaluation of Carbon Robotics Laser Weeder In Direct Seeded and Transplant Vidalia Onion Production Systems

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Introduction and Objectives

Weed Control in Vidalia Onions has become a challenge in recent years due to difficult to control weeds and limited herbicides available for use in the crop. According to a recent onion grower survey, two weed species in particular, Cutleaf evening-primrose (*Oenothera laciniate*), and Wild radish (*Raphanus raphanistrum L.*), are especially cumbersome to control in both transplant and direct-seeded production systems. Growers indicated they spent an average of \$1100 per acre to hand pull these weeds when herbicide control fails. A study was conducted at the UGA Vidalia Onion and Vegetable Research Center to evaluate the use of the Carbon Robotics Laser Weeder in both onion production systems. The Carbon Robotics Laser Weeder utilizes AI (artificial intelligence) technology to identify weeds in the crop and kill them using laser radiation without damaging the crop.



Local growers watch a field demonstration of the Carbon Robotics Laser Weeder, which uses AI technology to identify weeds and kill them with laser radiation without damaging the crop.

Materials and Methods

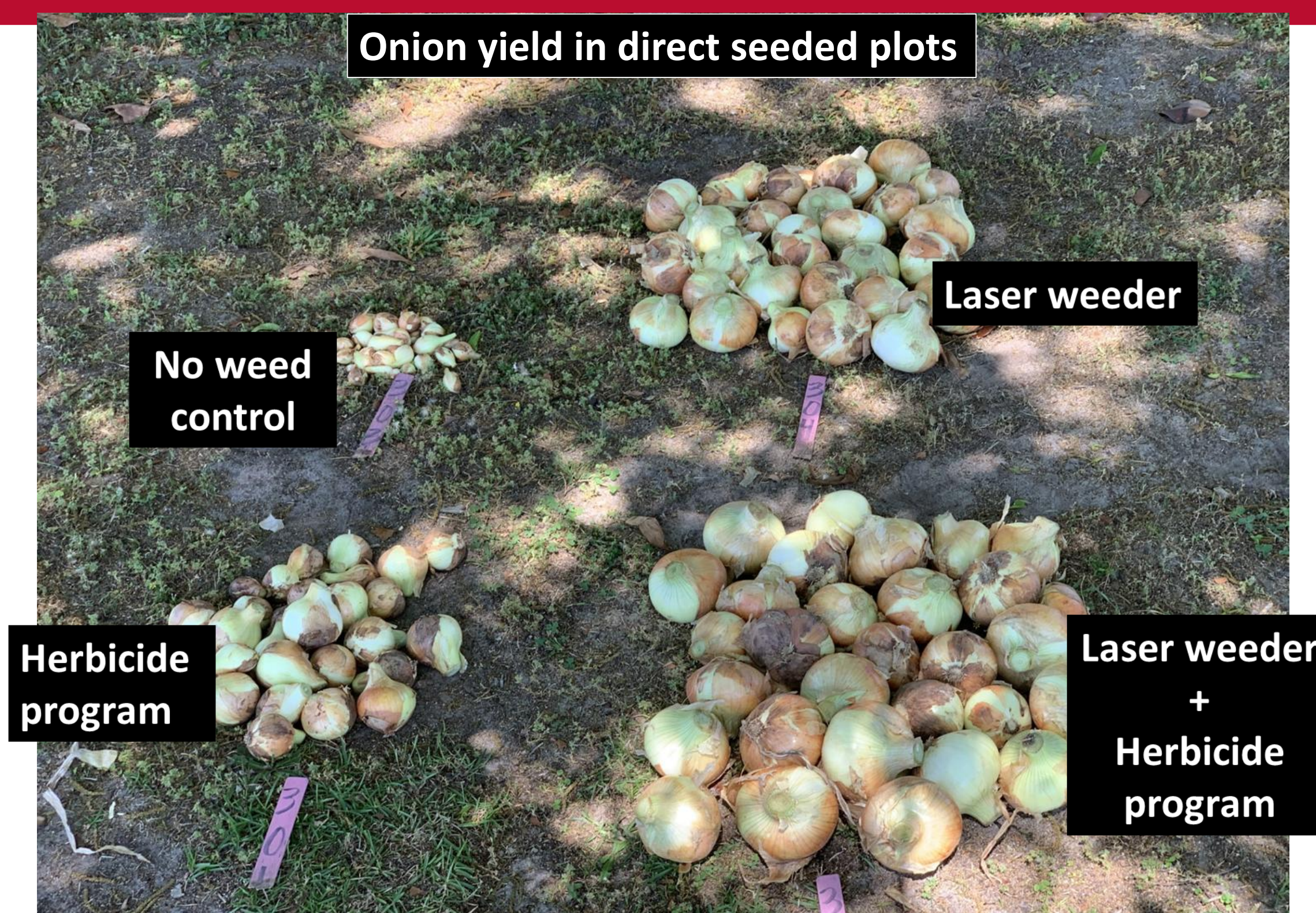
Direct Seeded, Planted Oct. 23rd

1. Laser Weeder alone - used on Nov. 9, Nov. 21, Dec. 5, Jan. 3
2. Standard herbicide program - Dacthal 3 pt/A PRE, Dacthal 3 pt/A @ Flag Leaf, Prowl 2 pt/A @ 2 leaf stage, GoalTender 4F .75 oz/A @ 2 leaf stage, Goaltender 4F .75 oz/A @ 3 leaf stage, GoalTender 16 oz/A @ 6 leaf stage, Prowl 12 oz/A @ 6 leaf stage
3. Laser Weeder + standard herbicide program
4. Untreated control

Transplant System (planted Nov. 16th)

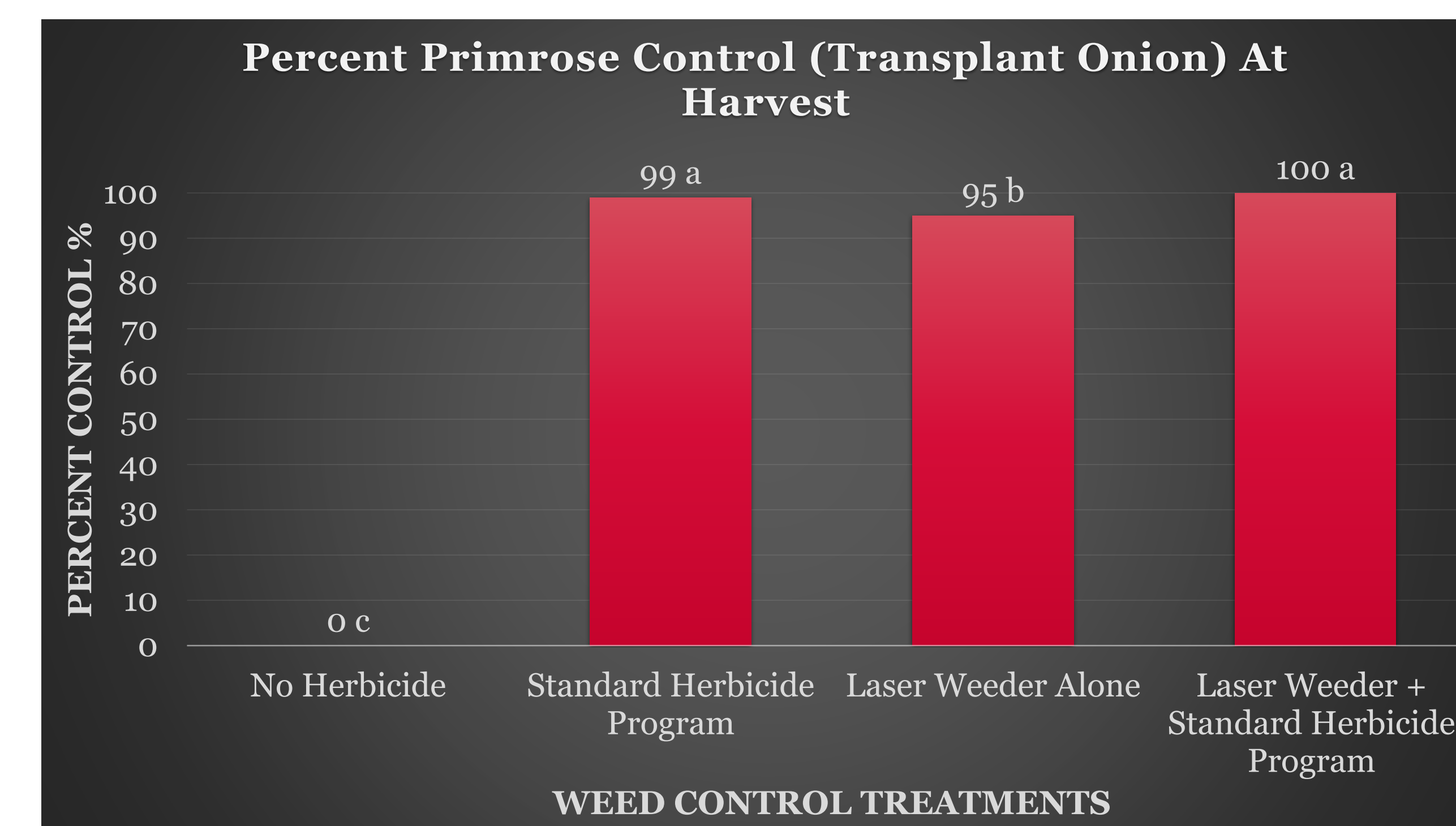
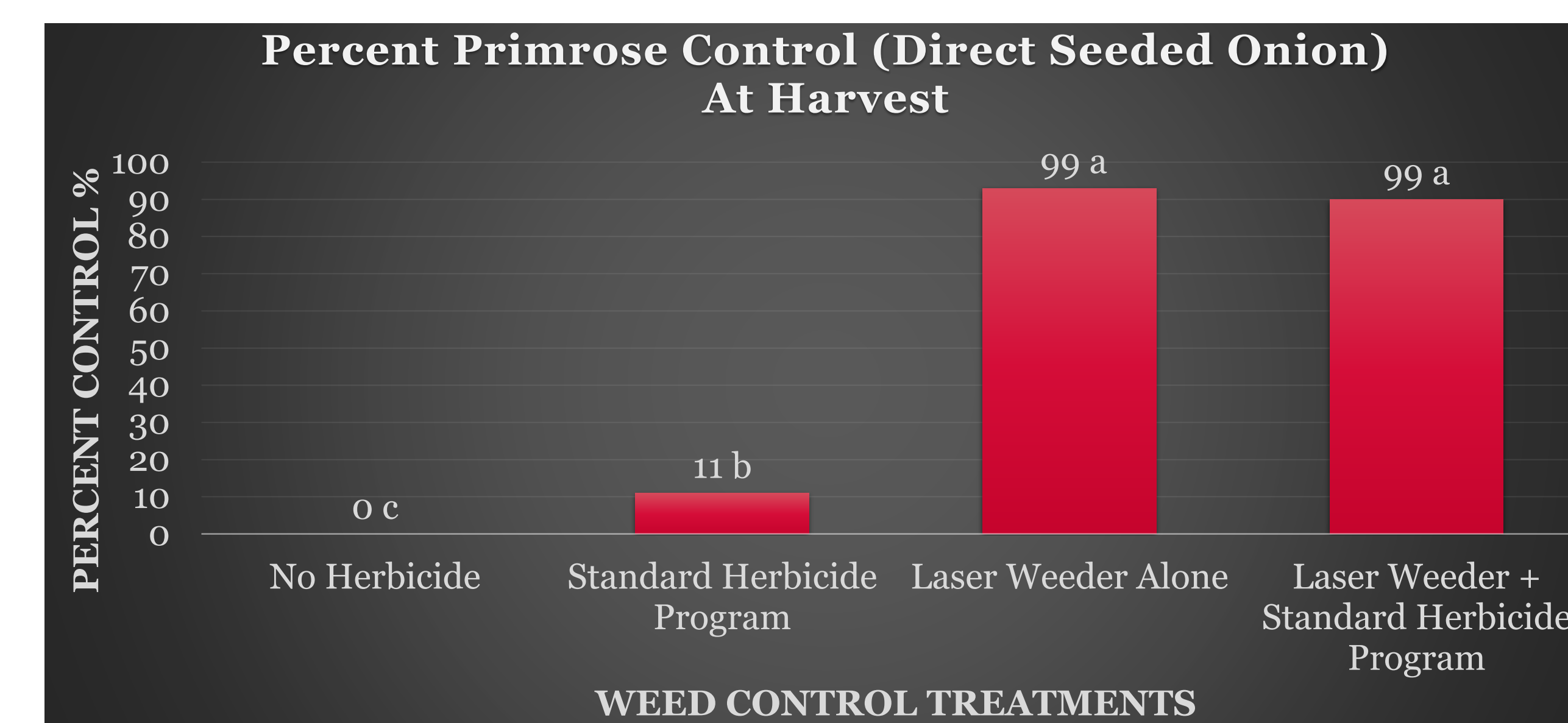
1. Laser Weeder alone – used on Dec. 5, Jan. 3, Feb. 27, Mar 21
2. Standard herbicide program – Goal 2XL 2 pt/A + Prowl 2 pt/A @ 2 days after transplant
3. Laser Weeder + standard herbicide program
4. Untreated control

Results and Discussion



The onions in the photo above show the size and number of onions harvested from a treatment in the direct seeded evaluation. Laser Weeder alone or combined with a herbicide program provided excellent weed control and favorable onion yields.

Results and Discussion



Conclusions from Direct Seeded Evaluation:

1. No treatment influenced plant stand
2. No injury observed from Laser Weeder
3. Laser Weeder provided excellent control of cutleaf evening primrose, wild radish, swinecress, and henbit
4. Compared to the herbicide program, average onion diameter and weight was at least 39% and 68% greater with Laser Weeder

Conclusions from Transplant Evaluation:

1. No treatment influenced plant stand
2. No injury from Laser Weeder
3. All programs (except untreated control) provided excellent weed control and yield.

Results were shared with growers at onion production meetings held over the last year at the Vidalia Onion and Vegetable Research Center. This directly reached an audience of 110 people. In addition, an on-farm demonstration of the technology reached an audience of 75 people. Results from the recent grower survey indicate that 100% of survey participants are interested in using new AI technologies, such as the Carbon Robotics Laser Weeder, if economically feasible for their operations. The data shows that the Carbon Robotics Laser Weeder can be an effective tool for controlling weeds in Vidalia Onions.