

Weed vs. Crop Differentiation Using Crop Marking Systems. HannahJoy Kennedy*¹, Steven A. Fennimore¹, John S. Rachuy¹, David C. Slaughter², & Thuy Tuong Nguyen². ¹ UC Davis, Dept. of Plant Sciences, Salinas, CA, 93905; ² UC Davis, Dept. of Biological and Agricultural Engineering, Davis, CA, 95616. *Corresponding author

Increasing weed control costs threaten vegetable crop grower profitability due to labor shortages, rising labor expense, as well as lack of and loss of herbicides. Automated weed control systems can help to contain or decrease weed control costs. Traditional inter-row mechanical cultivation is not sufficient, as it does not remove weeds within the seed line at early growth periods when competition for nutrients, water and light is critical. Thus, intra-row hand weeding is necessary, but increasingly expensive. Current intra-row weeders commercially available do not differentiate between crops and weeds, but rather rely on row pattern recognition. The row-pattern recognition systems are problematic where weed populations are high and the row pattern cannot be detected. In these weedy situations, the machines cease to function or cause damage to the crop. We are testing three methods to mark crops to make them distinct from weeds and detectable by a mechanized weeder: 1) Systemic Markers, 2) Topical Markers, 3) Plant Labels. The goal of the project is to develop automated weed control systems that achieve significant reductions in need for hand weeding and herbicides while maintaining a practical and cost-effective weed control system.