

A Comparison Between Automated Thinners and Hand Thinning of Lettuce in the Salinas Valley: Weed Control and Efficacy. Elizabeth Mosqueda¹, Richard Smith², and Anil Shrestha¹, ¹Department of Plant Science, California State University, Fresno, CA ²University of California Cooperative Extension, Monterey, CA

California's agriculture industry has been hindered by a severe labor shortage during the past years. As the leading producer of vegetable crops, a highly labor intensive commodity, this problem is even more detrimental in California. In 2012, growers of California's Salinas Valley, the leading producer of lettuce in the nation, began to implement the use of automated lettuce thinners. These innovative implements are meant to take the place of a hand thin crew in ensuring a lettuce crop is adequately spaced and weeded. As these implements are new to many growers, assessments on their efficiency to thin and weed lettuce are needed. Therefore, a study was conducted during the 2014 and 2015 lettuce season in the Salinas Valley. The experimental design was a randomized complete block design. During the 2014 season, 7 fields acting as a block were split into two plots and assigned a treatment (hand thinned or automatically thinned). During the 2015 season, one field was split into 4 blocks, and each block into two plots and were each assigned a treatment. During both seasons each block consisted of 5-10 randomly chosen sub plots from which data was acquired. Parameters measured were plant, weed and double (two closely spaced plants) counts, all done by performing counts prior and after thinning, and plant spacing measurements performed after thinning. Timings were also taken during the initial thinning process as well as the double/weed removal pass. The average lettuce thinning time was 3 to 4 times quicker with the automated than with the manual system. The automated system tended to leave more doubles than the manual system; however, the time required for removal of the doubles was similar between the two systems. Spacing of plants within rows was also similar between the two systems. In terms of weed removal, the automated system was as efficient as the manual system. The major weed species present were shepard's purse (*Capsella bursa-pastoris*) and annual sowthistle (*Sonchus oleraceus*). Therefore, automated thinning holds great potential to aid lettuce growers in the Salinas Valley.