RICE, CHARLES A.*, ABDEL MESBAH, AND STEPHEN D. MILLER, Department of Plant Sciences, University of Wyoming, Laramie, WY 82071. Economic evaluation of weed management systems in sugarbeets.

Effective season long weed control is imperative in sugarbeet production as sugarbeets compete poorly with weeds. Weed control represents a significant input cost in sugarbeet production. Due to the high cost of weed control interest has developed in less expensive yet effective weed management systems in sugarbeets. The development of herbicide tolerant and micro-rate herbicide programs may provide additional herbicide options and cost savings to the producer. Irrigated field studies were conducted at the Research and Extension Centers at Torrington; Wyoming in 1999 and 2000, and Powell; Wyoming in 2000 to evaluate economic costs and returns associated with glufosinate tolerant. glyphosate tolerant, and conventional and micro-rate weed management systems in sugarbeets. The experimental design was a RCB with a split plot arrangement having 3 replicates per treatment. Sugarbeet varieties Monohikari, Beta 2012 LL, and HM 1605 RR were planted at Torrington in 1999. Varieties planted in 2000 were Monohikari, Beta 4546 LL, HM 1605 RR at Torrington, and Ranger, Beta 8757 LL, and HM 130 RR at Powell. Plots at Torrington were planted to stand at a population of 68,000 seeds/A in 30-inch rows on 4/19/99 and 4/18/00. Plots were established at Powell on 4/25/00 in 22-inch rows and planted to stand at a population of 56,000 seeds/A. Seed, herbicide, and application costs were established by a survey taken in Wyoming and western Nebraska. Seed costs for herbicide tolerant varieties were based on current variety cost per unit (100,000 seeds) plus an \$80.00 technology fee per unit. Seed costs at Torrington ranged from \$55.08 to \$57.12 higher per acre for herbicide tolerant varieties as compared to the conventional variety. At Powell seed costs for the herbicide tolerant varieties were \$41.62 and \$42.18/A higher than the conventional variety. Each variety received 3 different herbicide treatments, a hand-weeded treatment, and an untreated check. Herbicide treatment costs ranged from \$26.06/A to \$39.09/A in the glyphosate tolerant system, from \$40.36/A to \$60.54/A in the glufosinate tolerant system, and from \$53.10/A for the micro-rate treatment up to \$94.20/A for the conventional standard treatment. Hand labor costs at Torrington averaged \$216.00/A in 1999 under light to moderate weed pressure and \$375.00/A in 2000 under heavy weed pressure. Hand labor weed control costs at Powell in 2000 averaged \$235.00/A with moderate weed pressure. Economic evaluation of weed management systems at Torrington in 1999 showed the conventional system produced the highest net returns overall while in 2000 the herbicide tolerant systems provided better weed control and higher net returns at both locations. The glufosinate (2LF)(14D)(28D) treatment produced the highest net return of \$549.85/A at Torrington and the glyphosate (2LF)(14D) treatment had the highest net return of ^{\$}637.54/A at Powell in 2000.

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