2.8 DON W. MORISHITA, KELLI M. BELMONT*, ERIK J. WENNINGER, HOWARD W. NEIBLING
University of Idaho, Kimberly Research and Extension Center, 3806 N. 3600 E., Kimberly, Idaho, US – 83341

TILLAGE SYSTEM, NITROGEN FERTILIZER, AND IRRIGATION EFFECTS ON INSECT, WEEDS AND SUGAR BEET YIELDS

ABSTRACT

Much is not yet clearly understood about the interactive effects of tillage level, nitrogen (N) fertilizer application rates, and irrigation amounts in sugar beet production. A field study was conducted in 2013 and 2014 at the University of Idaho Kimberly Research and Extension Center to study the effects of tillage, N fertilizer rate, and irrigation amount on weeds and pestiferous insects, root and sugar yields, nitrates, and conductivity. Three tillage treatments were established: conventional tillage (CT), strip tillage (ST), and direct seeding (DS). Four N fertility rates were applied at 50, 75, 100, and 125% of recommended rate for CT sugar beet. The irrigation treatments were based on sugar beet evapotranspiration (ET) and were: 50, 100, and 150% of ET. Experimental design was a split plot randomized complete block design with tillage as the main plot, irrigation as the sub-plot, and N rate as the sub-sub-plot. By the 12 leaf sugar beet growth stage, *Chenopodium album* and *Setaria viridis* densities did not differ between CT, ST, and DS at optimum irrigation and N rate. In 2013 leafminer egg and larval densities were greatest in CT compared with DS and ST. Averaged over 2 years, root yield was 8.7 and 6.7 Mg ha⁻¹ higher in CT and ST, respectively, than DS, but estimated recoverable sucrose did not differ between CT, ST, and DS. Combined yield and quality results over the 2 years indicated no significant interactions among tillage, irrigation, and N rates suggesting that N and irrigation recommendations do not need to be adjusted for tillage.