KOCH, DAVID W.[1], FRED A. GRAY[1], JAMES M. KRALL[2], AND JEFFERY W. FLAKE[1]*, [1]Plant Sciences Dept., Box 3354, Univ. of Wyoming, Laramie, WY 82071, and [2]Torrington Research & Extension Center, Box 374, Torrington, WY 82240. **Trap cropping for sugar beet nematode control in Southeastern Wyoming.**

Trap crop radish, *Raphanus sativus*, and mustard, *Sinapis alba*, are specially bred forage species designed to reduce sugar beet nematode (SBN), *Heterodera schactii*, populations when grown ahead of sugar beet, *Beta vulgaris*, in the rotation. This alternative to nematicides is important because nematicides represent one of the more costly inputs and have considerable potential for contamination of the environment and harm to the applicator. Trap crops have been effective in Europe, where the technology was developed, and UW research has shown them effective in the Big Horn Basin of North Central Wyoming. In the Big Horn Basin, best results were obtained when trap crops were seeded in summer, just after the malt barley harvest, followed by sugar beets the next season. Double-cropped radish and mustard are advantageous because they grow well and trap nematodes in cool, autumn weather, but do not require a full-season's resources. The goal of this research was to demonstrate the effectiveness of these trap crops as both full-season and double-cropped plantings in Southeastern Wyoming. Studies were conducted at three sites with cooperating producers whose fields had a history of problematic SBN infestations. Six trap-crop treatments included full-season mustard and radish, pea + oat followed by mustard and radish, and wheat followed by mustard and radish. Two SBN-neutral treatments included corn and wheat followed by fallow. Spring sown mustard and radish produced similar top-growth biomass from 4 to 11 Mg ha^{-1} among the three studies. Spring production was positively correlated to growing degree days available. Fall yields of summer-sown mustard and radish were also similar ranging from 4 to 9 Mg ha^{-1} with a trend for better production from radish than from mustard. Fall growing degree days did not always correlate to fall production where water became a primary limitation. Availability of late season irrigation is necessary to ensure good stands of summer sown trap crops. Trap-crop production is important for two reasons: 1) vigorous top-growth should correspond to vigorous root growth and improved SBN "trapping," and 2) these trap crops are quality forages and the cost of seeding can be largely offset from the weight gains of livestock grazing the trap-crop tops. Interestingly, the trap crops seemed to reduce SBN population little in the trap-crop year relative to the SBN neutral crops. A more pronounced effect was observed during the sugar beet season; however, trap crops were inconsistent in providing SBN reductions or increased sugar beet yields. Trends for better SBN suppression late in the sugar beet season were seen for full-season trap crops over double-cropping and for radish over mustard. Differences in sugar beet yields due to trap crop were minimal, although one site showed a trend for improved beet yield from 4 of the 6 trap-crop scenarios over the SBN-neutral crops. This improved yield, however, was not well correlated to improved SBN control from the trap crop. Nematicides Temik® (aldicarb) and Telone II® (1,3-dichloropropene) suppressed SBN populations with varying degrees of effectiveness in the sugar beet season whether preceded by SBN neutral crops or trap crops. Sugar beet yield, however, tended to improve with Telone II input across nearly all the trap/SBN neutral cropping scenarios.