

Evaluation of Rye Varieties for Weed Suppression in No-Till Corn

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Abstract

An increase in the use of conservation and no-tillage practices is expected in the future as the soil conservation provisions of the 1985 farm bill must be complied with by 1995. In order to meet conservation compliance, it is expected that the use of small grains as cover crops will increase. Winter rye residues have been shown not only to help conserve soil and soil moisture, but also to be effective in reducing weed problems through allelopathic chemical activity. No comparisons, however, have been made among rye varieties in the southeast as to their relative weed suppressing abilities or possible effects on corn yields. The objectives of this research were to evaluate eight varieties of rye, one wheat + rye mixture, and one triticale variety for differences in weed suppressing ability in no-till corn and to determine if the cover crop mulch exhibits any varietal effect on corn yield.

Ten small grain varieties were established at the Clayton and Rocky Mount, NC research stations on October 27, 1988 and October 31, 1988 respectively, in 12' x 40' plots. The varieties were AFC 2020, Athens Abruzzi, Bonel, Gurley Grazer, Mayton, Vita Graze, Wheeler, and Wrens Abruzzi ryes along with a wheat + rye and a Florico triticale treatment. Paraquat was applied to all treatments on April 21, 1989 at Clayton and May 20, 1989 and Rocky Mt. at a rate of 1 lb ai/acre as a burndown. The corn was subsequently no-till planted through the treated residue. No additional herbicides were used pre or postemergence except 2,4-D postemergence for redroot pigweed at one location.

Weed sampling began approximately two months after planting. A 0.5 x 0.5 meter square was randomly

thrown three times into each plot and all broadleaves and grasses falling inside were counted, collected, dried and weighed. This procedure was conducted over three time periods at Clayton and two at Rocky Mount. Yield data was also obtained for each plot.

Observations of the weed pressure in check rows compared to that in the treatment rows revealed that all treatments exhibited weed suppressing ability. Broadleaf densities and biomass indicated that no rye variety was significantly different from any other variety of rye for weed suppressing abilities. The Florico triticale treatment, however, showed significantly higher broadleaf and grass densities as well as biomass values at Clayton. This result was observed in both the individual sampling date comparisons as well as the data pooled over sampling times. These results were not apparent for either individual or pooled comparisons at Rocky Mount. The Vita Graze and Athens Abruzzi treatments, although non-significant, were noted to produce the lowest broadleaf densities at both locations. The Athens Abruzzi treatments were also noted to give consistently lower grass densities. Corn yields were unaffected by all cover crop varieties at both locations.

The results of this research indicate that Florico triticale as a mulch exhibits the least amount of weed suppression and that there is no difference in the weed suppressing abilities of the rye varieties. The results might also indicate that Vita Graze and Athens Abruzzi may be the varieties of choice for weed suppression in no-till corn. These results are preliminary and based on data obtained during the 1988-89 and the lack of significance may be partly due to the highly irregular environmental conditions (above normal rainfall) during this growing season. Weed suppression by the rye cover crop mulches was much better than normally might be expected. The same test is being repeated during the 1989-90 growing season.

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