Impacts of clover underseeding on Fusarium head blight, deoxynivalenol concentrations, crude protein, and grain yield on organic spring wheat in Vermont

Underseeding clover in wheat production is a practice utilized by numerous organic wheat producers in Vermont. Little is known about impacts of underseeding on Fusarium head blight (FHB) and its associated mycotoxin, deoxynivalenol (DON), which limits grain quality for human consumption. This study conducted in 2010 examined FHB and DON levels as well as other grain quality variables in organic spring wheat produced without clover underseeding compared to underseeding with either medium red clover at 12.5 lbs/acre (RC1), medium red clover at 25 lbs/acre (RC2) , or Ladino white clover at either 12.5 lbs/acre (WC1) or 25 lbs/acre (WC2) in three Vermont locations. The affect of clover understory on FHB and DON levels was checked by quantifying rain-splashed *Fusarium* spp. inoculum collected from experimental plots at heights of 30 and 100 cm. Colony forming units (CFUs) quantified from splash samples plated onto Nash-Snyder agar media were compared to FHB and DON levels, hypothesizing that FHB, DON, and CFUs would be highest in control plots, and that clover treatments may produce higher grain yields and crude protein. Statistically significant differences ($p<0.05$) in treatment means of FHB incidence were observed at Alburg and Randolph Center locations. Significant differences in mean DON concentrations were also seen at the Alburg site, though all Alburg treatment means exceeded the threshold of 1 ppm set for human consumption. *Fusarium* spp. CFUs from samples taken from one South Burlington rain event showed statistically significant differences between WC1 at 100 cm (22.83 CFUs/mL) and control treatments at 30 cm (0.83 CFUs/mL). Differences in mean crude protein and grain yield were significant at Alburg, and in yield at South Burlington. In addition to potential for increased crude protein and yields in wheat underseeded with clover, this study indicates that clover understory may impede splash dispersal of *Fusarium* spp. inoculum.