

**PROGRESS REPORT  
TO  
NORTH CAROLINA SMALL GRAIN GROWERS ASSOCIATION, INC.**

**TITLE:** Italian ryegrass Germination Biology and Methods of Control

**LEADER(S):** Wesley Everman

**DEPARTMENT(S):** Crop and Soil Sciences

**REPORT:**

In November of 2019, my Research Technician resigned and I was not able to refill the position through the winter. My research capabilities were reduced due to the unexpected vacancy. In addition, reduced acreage planted to wheat and mild winter made it difficult to identify enough fields to collect seeds. I was able to collect seed from a couple of locations, but this seems inadequate to conduct a fair assessment of biodiversity in the state. Therefore, I propose to return the funds awarded for this trial and am requesting a restart for this research project starting in Fall of 2020. I have personnel in place to conduct the trial, and have identified potential collaborators.

**BUDGET / EXPENDITURE UPDATE:**

None of the \$5,000 awarded for this project has been spent to date. As described above, other resources were used to develop preliminary data.

**IMPACT STATEMENT:**

Color and multispectral imagery collected from 3 different altitudes throughout the season in two locations investigating various densities of Italian ryegrass in wheat revealed several key results that can be used for future research, and in applied data collection. First, and foremost, Italian ryegrass could accurately be identified at various densities and stages throughout the season. This provides evidence of value. In addition, there were no differences in accuracy when assessing color imagery compared to multispectral data. This indicates a grower or consultant does not need expensive sensors to detect Italian ryegrass in wheat. Finally, although it may seem insignificant, we determined that altitude of UAV flight does not significantly impact accuracy of species separation. This could be one of the most important factors, since this will impact flight time and number of acres covered. Since we get the same accuracy flying at 150 feet as we do at 50 feet, we can fly the UAV at 150 feet, covering more land area per swath, reducing flight time and increasing number of acres covered per flight.

A graduate student has successfully completed his defense on this research, and the full thesis will be made available once it is approved by the committee and University.

Overall, results show promise for growers to use inexpensive UAV platforms with color cameras to detect and map Italian ryegrass populations early in the season.