WISCONSIN– Closing the Alfalfa Yield Gap & Increasing Resilience to Climate Change

Valentin Picasso, University of Wisconsin-Madison

Alfalfa research over the past decades has provided improved varieties and agronomic management practices, which have significantly increased alfalfa yield potential. However, average alfalfa yields on farm remain a fraction of potential yield. With the goal of closing the yield gap, we are identifying farmers and fields in Wisconsin with the highest alfalfa yields and documenting the management practices key to their performance. An MFA-funded project will provide initial data of ~10 farmers in 2020. We are using a "lighthouse approach," collaborating with extension agents to identify alfalfa farmers with relative high yields in the past. An in-depth questionnaire of management practices was designed, including: soil test analyses, alfalfa variety, establishment practices, inputs, and harvest practices. After this season, we will analyze the data and identify practices relevant to closing the alfalfa yield gap. Farmers and collaborators interested in participating should email picassorisso@wisc.edu or your extension agent.

Rainout shelters test the resilience of alfalfa cultivars to drought, Arlington, WI.

Resilient alfalfa production systems are needed to endure increasing weather variability. A NIFA-ASAFS funded project will reduce risk to farmers and industry by increasing the resilience of alfalfa cultivars to abiotic stresses: drought and cold. Resilience is the ability of a forage system to withstand and keep producing under a climatic crisis. Last year, a diverse range of 20 modern alfalfa cultivars from major alfalfa companies were planted in replicated field experiments in three states to evaluate resilience to water and cold stresses. The treatment design has two factors: environmental stress and alfalfa cultivar. Water stress factor has two levels: water deficit and no water stress. In Wisconsin, the water-deficit treatment is generated by using rainout shelters to exclude ≥50% of the rain in the growing season; the no stress treatment is normal rainfall. Cold stress factor has two levels: cold stress (forced by an intense harvest management with a harvest in late September increasing plant sensitivity to winter injury), and no cold stress (with the last harvest in early September to allow accumulation of reserves prior to winter). Data are being collected during this growing season and will also be collected in 2021.