YIELD MONITORING, MAPPING AND VARIABLE RATE FERTILIZATION FOR HAY AND SILAGE PRODUCTION

K.R. Kirk, P.J. Loftis, J.G. Andrae, G.S. Sell[1]

The precision agriculture technologies generally associated with row crop production can be equally beneficial to forage crops. One key aspect of precision agriculture allows the producer to assess and manage for spatial variability in his fields; simply put: different areas of each field have different needs. While most growers generally know where the high and low yielding areas of a field are, a yield map can help quantify and delineate this understanding. Unfortunately, no yield monitors have been developed or are commercially available for forage crops. We have recently developed and field tested a windrow monitor based on ultrasound technology which allows forage yield mapping. Yield monitor options in silage systems will also be reviewed. One important application of this knowledge for forage production would be in the form of variable rate nutrient application. Knowledge from the yield map of the amounts of nutrients being removed from the field can be applied to return nutrients for the subsequent harvests; the yield map can provide guidance on how to subdivide the field into separate management zones, each receiving different nutrient rates according to need. Uniform nutrient applications "to meet the average needs" result in under-application and therefore yield deficits in the most productive areas of the field and over-application and waste in the least productive areas. The goal of variable rate nutrient application is not to equalize yields across the field, but to place nutrients at appropriate rates according to need. Variable N applications have been tested and will be discussed along with yield monitoring implications.

[1]Precision Agriculture Engineer, Clemson Univ., Edisto REC, Blackville, SC (kirk2@clemson.edu); Graduate Student, Clemson Univ., Plant & Environmental Sciences, Clemson, SC (ploftis@g.clemson.edu); Director and Forage Specialist, Clemson Univ., Simpson REC, Clemson, SC (jandrae@clemson.edu); Forage Bull Test Coordinator, Clemson Univ., Edisto REC, Blackville, SC (gsell@clemson.edu).