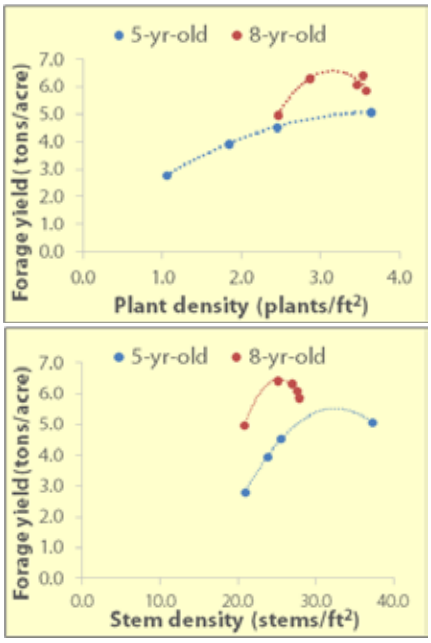
NORTH DAKOTA - What is the Best Method to Estimate Forage Yield in Older Alfalfa Stands? Plants vs. Stems

Marisol Berti, North Dakota State University

As alfalfa stands get older, plant density and forage yield decrease. The objective of this research was to develop a method to estimate forage yield in older alfalfa stands. Replicated experiments were established in 4- and 7-year-old alfalfa stands in Fargo and Prosper, ND. Initial plant density treatments were established at both sites and initial density treatments fluctuated between 1 and 5 plants/ft^2. In the fall of 2013 and 2014, the number of plants and number of stems were counted in each treatment previous to the last harvest in the fall.

Figure 1. Forage yield of 5- and 8-year-old stands estimated with plant and stem density.



Results indicated that as plants get older, both plant and stem density decrease. In 2014, the maximum forage yield was 5 and 6 tons/acre for the 5- and 8–year-old fields, respectively. Maximum forage yield for both was with 3 to 4 plants/ft^2 or 25-30 stems/ft^2.

Figure 2. Younger healthy alfalfa plant (left) and older winter-injured or diseased plant (right).

Forage yield estimation with the regression model was more accurate with stems/ft^2 than plants/ft^2 (Figure 1). Older plants have a fewer number of stems per plant since part of the crown may have suffered winter-injury or disease (Figure 2). A younger alfalfa plant will have many more stems per plant. As stands get older, the number of injured plants increases and stem density estimates forage yield better than plant density.