# NORTH DAKOTA - Alfalfa-Corn Intercropping May Increase Forage & Improve Soil Health

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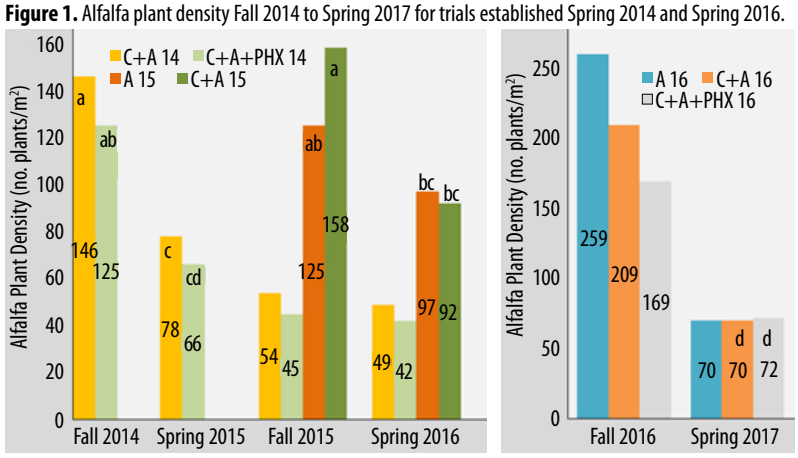
Alfalfa and corn silage are important livestock forages in North Dakota. Alfalfa hay is high in quality while corn silage is preferred for its high tonnage. Alfalfa yield in the seeding year is low, 1-2 cuts for a total seasonal forage of 2-3 tons/ac. Due to this limitation corn silage is preferred, producing 10-15 tons/ac/yr. Planting alfalfa into corn (two different planter passes), allows alfalfa to get established under the corn canopy. The following year alfalfa is already established and will have a seasonal forage yield of 5-6 tons/ac. As part of a USDA-NIFA CAP research grant, alfalfa-corn intercropping is being evaluated at Fargo, Prosper, and Forman, ND; Waseca, MN; and Ames, IA. Results across all locations and years indicate alfalfa establishes itself well whether a growth regulator, prohexadione (PHX) to control alfalfa height and growth, is applied or not. Alfalfa plant density decreased mainly in the first winter, stabilizing thereafter (Figure 1). Corn grain yield decreased ~30 bu/ac when intercropped with alfalfa (Figure 2). Alfalfa seasonal forage yield in the first production year increased from 2.5 tons/ac to 5.0 tons/ac (Figure 3). A quick economic analysis of this system shows a net gain of $160/ac (alfalfa seasonal yield gain in first production year is 2.5 tons/ac x $100/ton=$250; minus 30 bu/ac corn grain yield loss x $3/bu= $90).

**Figure 1.** Alfalfa plant density Fall 2014 to Spring 2017 for trials established Spring 2014 and Spring 2016.




C=Corn, C+A=alfalfa-corn intercropping, C+A+PHX=corn-alfalfa intercropping w/PHX application to interseeded alfalfa.

**Figure 2.** Corn grain yield and % grain yield reduction with alfalfa intercropping or alfalfa with PHX treatment.

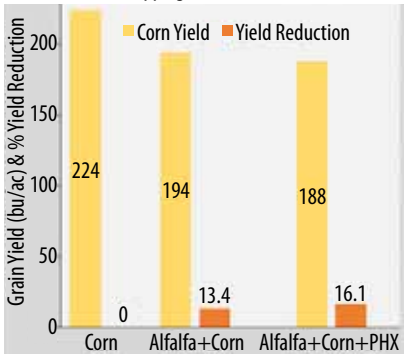



**Figure 3.** Alfalfa established with corn in Spring 2014 had double the yield of alfalfa established in Spring 2015.