

Alfalfa-corn intercropping is a potential alternative to increase forage production while improving soil health.

Alfalfa and corn silage are important forages for livestock in North Dakota. Alfalfa hay is high in forage quality while corn silage is preferred for its high tonnage.

Alfalfa forage yield in the seeding year is low, 1-2 cuts for a total seasonal forage of 2-3 tons/acre. This is a limitation of alfalfa that makes producers to prefer corn silage because they can produce 10-15 tons/acre of silage every year.

Planting alfalfa into corn at the same time (two different planter passes), allows alfalfa to get established under the corn canopy. The following year alfalfa is already established stand and will have a seasonal forage yield of 5-6 tons/acre. If you plan to establish alfalfa the year after your corn, then this system could work for you. But we are still learning about the system.

Why would we want to do alfalfa-corn intercropping?

Alfalfa provides some N to the corn

Alfalfa covers the soil during the winter after the corn is harvested

Alfalfa improves soil health- deep roots and N₂ fixing

Alfalfa is winter-hardy and will survive the winter

Protects the soil from erosion

Uses excess soil water in the spring

Corn stover and alfalfa in between the rows can be used as forage for grazing late in the fall

The forage yield of alfalfa is 2 to 3 tons/acre more than alfalfa established in the spring (See figure)

**ALFALFA-CORN
INTERCROPPING -
PRELIMINARY RESEARCH
RESULTS**

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What are the risks and unknowns?

- Corn grain yield decreases in 20-30 bu/acre
- Alfalfa is a high water user and it will compete with water with corn, especially in a dry year
- Alfalfa potato leafhopper damage is higher in interseeded alfalfa
- Using prohexadione (PHX), a growth regulator, to improve alfalfa plant establishment and yield did not result in any benefits.

Questions remaining

- How much N alfalfa provides to corn during the season
- Will alfalfa survive the winter if grazed in late fall?
- Economic return of the system?

If we quickly calculate a yield loss of 30 bu/acre @ \$3/bu is \$90. With this system the forage yield of alfalfa hay the first year will be 2-3 tons/acre more than if planted in the spring.

2 tons/acre x \$100/ton is \$200.

The cost of seeding alfalfa with corn is the same as if were planted a year earlier with the corn.



DISCLAIMER: Information in this handout is geared towards 30" corn rows and alfalfa at 6" rows planted at the same time in the spring. Both corn and alfalfa varieties used were glyphosate-resistant and prohexadione-calcium was tested to determine if alfalfa establishment was improved.

The results shown here are still in research stage. The system has not been fully tested on-farm, although preliminary results are promising. Farmers can test alfalfa-corn intercropping in small acreage to see if the system will work for their operation.

Be aware that with alfalfa-corn intercropping you will have a yield loss in corn. Losses will depend on weather conditions. More losses will be expected in a dry year.

Products indicated were used in this research. NDSU does not endorse any specific product or brand.

