

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

Historical Materials from University of
Nebraska-Lincoln Extension

Extension

1974

G74-131 No-Till Corn in Alfalfa Sod

Alex R. Martin

University of Nebraska - Lincoln, amartin2@unl.edu

Russell S. Moomaw

University of Nebraska - Lincoln

Follow this and additional works at: <https://digitalcommons.unl.edu/extensionhist>



Part of the [Agriculture Commons](#), and the [Curriculum and Instruction Commons](#)

Martin, Alex R. and Moomaw, Russell S., "G74-131 No-Till Corn in Alfalfa Sod" (1974). *Historical Materials from University of Nebraska-Lincoln Extension*. 1916.

<https://digitalcommons.unl.edu/extensionhist/1916>

This Article is brought to you for free and open access by the Extension at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Historical Materials from University of Nebraska-Lincoln Extension by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

NebGuide

PUBLISHED BY COOPERATIVE EXTENSION SERVICE
INSTITUTE OF AGRICULTURE AND NATURAL RESOURCES
UNIVERSITY OF NEBRASKA - LINCOLN



G74-131

(Revised November 1975)

No-Till Corn in Alfalfa Sod

Russell S. Moomaw, Extension Crops and Weed Specialist

Alex R. Martin, Extension Weeds Specialist

Nebraska produces about 1,740,000 acres of alfalfa annually. Corn or grain sorghum usually follows alfalfa in the crop rotation. The moldboard plow or chisel plow are commonly used to break up alfalfa sod for corn planting. The plow is a high consumer of energy, requiring about 2.25 gallons of diesel fuel per acre.

Research conducted in Nebraska has been used to develop a system in which the alfalfa is killed with herbicides and corn is planted directly into the sod without tillage. Plowing is eliminated and energy requirements can be reduced to about 1/4 that used in the conventional plow system (Table 1).

Table 1. Specific diesel requirements for tillage, planting and harvesting in the plow and slot-plant systems.¹

Field Operation	Conventional Gal/A	Slot-plant Gal/A
Plow	2.25	
Disk	0.74	
Harrow, spring	0.64	
Plant	0.52	0.52
Spray	0.23	0.23
Cultivate	0.43	
Cultivate	0.43	
Combine	1.25	1.25
Total	6.49	2.00

¹From the Nebraska Fuel Use Survey.

Reducing the number of field operations can reduce costs \$30 to \$35 per acre as compared with conventional planting. The annual labor required for slot-planting an acre of corn can be as low as 1/2 hr/A. Conservation tillage practices that maintain crop residues on the soil surface reduce soil erosion as much as 90% when compared with clean tillage. Corn yields from slot-planted corn in alfalfa sod averaged 6 bu/A higher over three years than yields from plowing alfalfa.

Vegetation Control

There are two parts to controlling vegetation when planting into alfalfa sod. The alfalfa itself must be eliminated, and subsequent invading annual grass and broadleaf weeds must also be controlled. No single herbicide will accomplish both.

Alfalfa control. Research has shown the most consistent alfalfa control results from a combination of 1 qt 2,4-D (4 lb/gal) + 0.5 pt Banvel/acre. Applications in mid to late April when alfalfa has at least 4 inches of new growth are most effective. Apply the herbicides to the alfalfa when weather forecasts indicate daytime air temperatures will be 55°F or above for several days. Alfalfa control will be more certain when it is growing vigorously at these temperatures. Kill alfalfa as early in the spring as growing conditions permit to conserve soil moisture.

Annual weed control. The 2,4-D + Banvel treatment applied in the spring to kill alfalfa will also control emerged broadleaf weeds. However, another herbicide treatment with soil residual activity is needed to control annual grasses and later emerging broadleaf weeds. Base preemergence herbicide selection on expected weed species, crop rotation, and soil type. Dual or Lasso + atrazine at a rate matched to soil type should give satisfactory weed control. Consult the latest edition of EC-130, "A Guide for Herbicide Use in Nebraska," for more information. A copy may be obtained from your Cooperative Extension Service office.

Sequence of herbicide applications. There are two possible sequences of herbicide application in the alfalfa slot-plant system.

1. The herbicide to kill alfalfa is applied first, followed in about 2 weeks by a preemergence herbicide applied at crop planting time for annual weed control. Broadcast the preemergence herbicide unless cultivation is anticipated, in which case a row-banded application may be satisfactory.

2. Tank mix the herbicide to kill alfalfa with the annual weed control herbicide. This saves time and can eliminate one trip across the field. AAtrex or atrazine + Banvel at 2 qt + 0.5 pt/A applied preplant eliminated alfalfa and controlled annual weed growth in Nebraska research. AAtrex or atrazine + 2,4-D + Banvel at 2 qt + 1 qt + 0.25 pt/A should also be effective. However, do not use such preplant herbicide applications if the planter will throw much soil away from the corn row as weed control may be reduced.

Planting Equipment

No-till planters with rolling coulters and slot or double disk seed furrow openers are commonly used in sod-plant systems. Several planters are currently available that are capable of planting into this environment. Additional weight may be needed on these planters to get enough penetration for good seed corn placement and coverage. These planters cause minimum soil disturbance, resulting in maximum protection from soil erosion.

Till or ridge planters equipped with either sweeps or disk furrowers or other row cleaning devices will also work in killed alfalfa sod. Farm operators with till-planters may prefer to cultivate the corn to establish the row ridge for the following year.

Some farm operators report using a conventional surface planter to plant corn in a sod cover. The procedure is to kill the alfalfa with herbicides, disk once or twice, and then surface plant.

Careful adjustment and operation of the planting equipment is essential when planting into alfalfa sod or corn stands may be poor.

Fertilizer Application

A three-year-old stand of alfalfa should supply the nitrogen needs of an 80 bushel per acre dryland corn crop in the first year. Whether the nitrogen fixed in the alfalfa root system is released as quickly under no-tillage as it is when alfalfa is plowed is not known. However, Nebraska research indicates that the first year nitrogen needs of dryland corn no-till planted into killed alfalfa are met without additional supplies. Irrigated corn would require additional nitrogen.

Supply phosphorus, zinc, and other fertilizer nutrients based on soil test information. The primary difference is in placement of these fertilizer nutrients. The no-tillage system prohibits soil mixing of liquid or dry fertilizer applied on the surface. The starter fertilizer must be placed either to the side of or below the seed. Soil temperatures will be cooler in alfalfa sod than under conventional tillage. Corn will have a more critical need for early, easy access to needed fertilizer nutrients.

Variety Selection

When selecting a corn hybrid for planting in alfalfa without tillage, look for several important features. One is cold tolerance. Rapid germination and emergence are desirable. The seed corn tag should indicate 95% or better germination. Early season corn hybrids are often suited to no-till situations because they have good cold tolerance and fast emergence. Tolerance of the hybrid to leaf diseases may be desirable. Surface residues with no-tillage may provide a favorable environment for the development of some leaf diseases.

Insect and Rodent Control

Soil insect problems tend to increase when corn is planted in sod covers. Use planter box insecticide treatments to control seed corn maggots and other soil borne insects. Cutworm and wireworm control may be applied over the seed furrow at planting. These insecticides need to be covered with soil, which is difficult with some slot-plant systems. Effective insecticides can also be applied postemergence for cutworm control. Corn rootworm larvae control should not be necessary in corn following alfalfa.

Rodents are more active in alfalfa sod cover than with clean tillage. They follow the slot opened in the sod by the planter unit and destroy some corn seed. A 2-inch seed depth placement reduces this problem.

Metric Conversion Table

English	Multiply by	Metric
Inch (in)	2.54	Centimeter (cm)
Acre (A)	0.4	Hectare (ha)
Pint (pt)	0.47	Liter (l)
Quart (qt)	0.95	Liter (l)
Gallon (gal)	3.8	Liter (l)
Bushel (bu) of corn	25.2	Kilogram (kg)
°Fahrenheit (°F)	$^{\circ}\text{F} - 32 \div 1.8$	°Celsius (°C)

File under: **FIELD CROPS**
C-1, Corn

Revised November 1975, 7,500