Natural Resources Conservation Service

CONSERVATION PRACTICE STANDARD

CONTROLLED TRAFFIC FARMING

CODE 334

(ac)

DEFINITION

Controlled traffic farming (CTF) is confining all high load wheel/track traffic from farm equipment to specific lanes or tramlines (traffic pattern) in crop fields year after year.

PURPOSE

This practice is used to accomplish one or more of the following purposes–

- Improve soil health by limiting wheel traffic compaction to limited traffic lanes

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to cropland where wheel traffic can be limited to specific traffic lanes.

CRITERIA

General Criteria Applicable to All Purposes

Ensure that controlled traffic lanes are designed and used in a manner that avoids concentrated flow that may result in gully erosion.

Limit wheel/track traffic to no more than 33 percent of the soil surface. The same tracks must be used for all high load traffic continually. High wheel load traffic is defined here as any tire or track that bears a load higher than 6,000 pounds at 30 psi or 6 tons per axle.

If wide flotation tires are used they must be big enough that the inflation pressure will be below 18 psi to minimize compaction on trafficked rows.

Using an ***auto-steer technology with guidance from a*** Geographic Positioning System (GPS) to guide field operations and wheeled/track traffic ***is required to locate and use the same traffic lanes year after year.***

Once the tram lines or traffic pattern is established, do not till deeper than 4 inches**.**

CONSIDERATIONS

For narrow width or drilled crops, use a skip row system (where the wheel tracks are not planted) ***and*** use ***auto-steer technology with GPS guidance.***

Recognize tire or rubber tracks should be less than 26 inches wide or less than the row crop spacing. Wide flotation tires do not work well in a CTF system. Split duals are a better alternative if single tires are inadequate.

Once tramlines are well established, operations which previously required the use of duals or extra-wide tires may no longer need them. Removing duals will significantly reduce the amount of trafficked area.

Extend the front axles of tractors to match the rear tires to reduce traffic lanes.

All traffic (high and low load) that crosses the field should utilize the designated traffic pattern. This includes custom applicators, pickup trucks, etc.

Consider no-till or direct-seed planting systems to further reduce compaction.

Utilize cover crops known to help reduce compaction, ***following the Vermont specification guide sheet.***

Consolidated tramlines have lower rolling resistance and wheel slip than cultivated soil.

The compacted traffic lanes/tramlines are able to support higher axle loads, so tramlines also allow machinery access in higher soil moisture conditions.

Consolidated wheel tracks increase traction and reduce cultivation draft in the uncompact soil.

Consider subsoiling prior to establishing the controlled traffic lanes.

Repair all ruts prior to establishing the system.

When soil moisture conditions are prone to cause soil compaction, limit field access to field equipment and livestock.

Soil moisture content that would increase compaction of the tramline or during grazing of livestock to trample field should be avoided.

Axel loads of 10-12 tons should be restricted to the turn row/head row portion of the field.

Consider establishing grass for the field's head row traffic, areas dedicate to harvest unloading, temporary storage, staging areas and point rows for turning traffic.

All equipment should cover the same working width or multiples of that width. Adjust the traffic pattern of each piece of equipment to minimize the number of lanes or tramlines across the field.

As older equipment is replaced, consider the working width of the equipment and how it fits into the controlled traffic farming system. The goal of controlled traffic farming is to limit the wheel/track traffic to as low a percent of the field as possible. This can be improved by having all equipment with the same working width or multiples of that width.

Utilize hitch offsets in no-till systems to avoid salt buildup and/or pH imbalances where fertilizer is banded in the same zone year after year. Hitch offsets can also help with positioning row placement in relation to previous crop rows and residues without altering wheel track lanes.

Extend tractor tires or tracks to the width of the combine and grain cart to reduce traffic lanes. Be sure to check equipment warranty when extending axle widths.

PLANS AND SPECIFICATIONS

Plans and specifications shall be prepared for each field site where the Controlled Traffic Farming system will be installed. Record practice specifications on the Controlled Traffic Farming Implementation Requirement document. Plans and specifications will include:

- Crops to be grown
- Row widths of all crops
- Width and spacing of tires/tracks of all equipment

- Percent of the field that receives controlled traffic

OPERATION AND MAINTENANCE

As older equipment is replaced, purchase equipment that will enhance the CTF system, reducing the number of tramlines in the system.

If ruts develop, use tillage or other specialized equipment to remove ruts and reestablish controlled traffic lanes.

REFERENCES

Reeder, Randall, and John M. Smith. 2000. Controlled Traffic. In: Conservation Tillage Systems and Management, MWPS-45. Midwest Plan Service, Ames, IA. (Pages 77-82).

Reeder, Randall C. 2002. Controlled traffic. Encyclopedia of Soil Science. Marcell Dekker, Inc. pp.233-236.

M.A. Hamza, W.K. Anderson 2005 Soil compaction in cropping systems - A review of the nature, causes and possible solutions. Soil & Tillage Research 82 (2005) 121–145.

Sjoerd Duiker,. 2004. Avoiding Soil Compaction. College of Agricultural Science, Agricultural Research and Cooperative Extension. Penn State University.

Hargreaves, P.R., Peets, S., Chamen, W.C.T., White, D.R., Misiewicz, P.A. and Godwin, R.J. 2017. Potential for Controlled Traffic Farming (CTF) in Grass Silage production: agronomics, system design and economics. Cambridge University Press. Volume 8, Special issue 2.