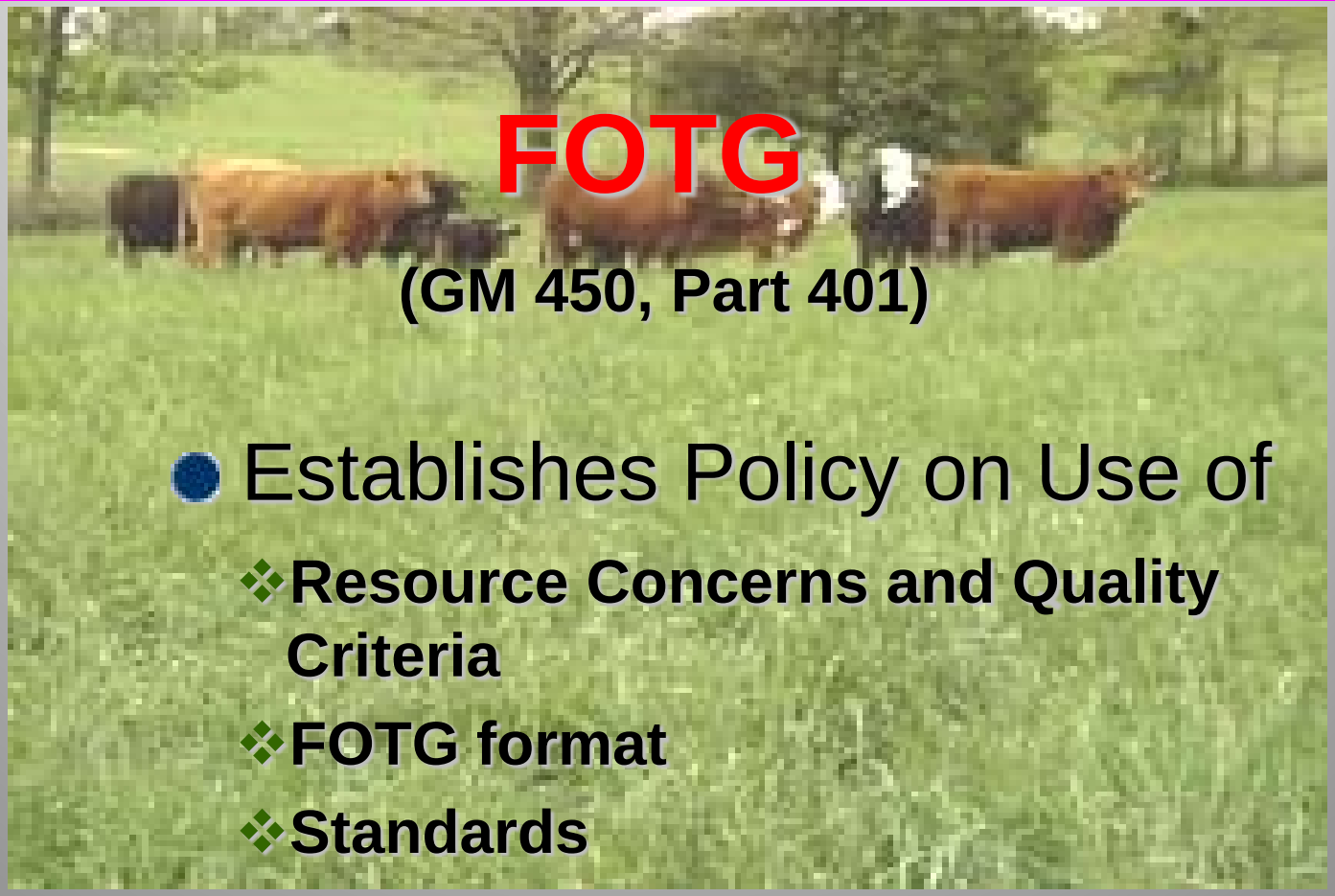
Missouri NRCS Conservation Planning Course

Dwaine Gelnar
State Resource Conservationist

Module 1E – 2013
Field Office Technical Guide (FOTG)

CONSERVATION PLANNING



FOTG

(GM 450, Part 401)

- Establishes Policy on Use of
  - **Resource Concerns and Quality Criteria**
  - **FOTG format**
  - **Standards**

CONSERVATION PLANNING

GM_450_401 - Part 401 - Technical Guides

Subpart A - Policy and Responsibilities

401.0 General

- NRCS has national technical responsibility
- FOTGs are the primary NRCS technical reference.
- FOTGs are localized.
- FOTG is maintained for each NRCS field office as a compilation of technical knowledge and standards.

CONSERVATION PLANNING

Subpart A - Policy and Responsibilities

401.3 Content of FOTGs

Each FOTG contains Five Sections

(1) Section I – General Resource References.

(2) Section II – Natural Resources Information.

(3) Section III – Resource Management Systems and Quality Criteria.

(4) Section IV – Practice Standards and Specifications.

(5) Section V – Conservation Effects.

CONSERVATION PLANNING

Subpart A - Policy and Responsibilities

401.3 Content of FOTGs

Section II – Natural Resources Information.

- Soils Information.
- Climatic Data.
- Cultural Resources Information.
- Special Environmental Concerns.
- Forage Suitability Group Descriptions.
- Ecological Site Descriptions.

CONSERVATION PLANNING

Subpart A - Policy and Responsibilities

401.3 Content of FOTGs

Section III – Resource Management System (RMS) and Quality Criteria:

- Quality criteria for treatment required to achieve a RMS and to achieve program quality criteria will be established by NRCS and filed in Section III of the FOTG.

CONSERVATION PLANNING

Subpart A - Policy and Responsibilities

401.3 Content of FOTGs

Section IV – Practice Standards and Specifications.

- Conservation practice standards establish the minimum level of acceptable quality for designing, installing, operating, and maintaining conservation practices.
- Practice documentation requirements list minimum documentation to be completed and provided to NRCS when the practice is completed and certified.
- SOWs provide the minimal requirements to design, install, and certify completion of conservation practices and other technical services.

CONSERVATION PLANNING

Subpart A - Policy and Responsibilities

401.3 Content of FOTGs

Section V – CEs

- CE's provide indicators of the impact that conservation practices have on natural resource concerns.
- They are recorded in the CPPE database filed electronically in Section V of the FOTG.

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Technical Resources

- Agronomy
- Comprehensive Nutrient Management Planning (CNMP)
- Contracting Opportunities
- Cultural Resources
- Ecoregional Planting Guides for Pollinators
- Engineering Tools and Resources
- Field Office Technical Guide (eFOTG)
- Forestry and Agroforestry
- Forms
- GPS Support
- Grasslands
- Maps, Imagery, and Data Resources
- Missouri State Technical Committee
- Missouri Wetland Mapping Conventions
- Natural Resource Data and Analysis
- Nutrient Management
- Plant Materials
- Rapid Watershed Assessments
- Reports
- Soils
- Standards - drafts
- Technical References (includes MO Technical Notes, Job Sheets, Information Sheets)
- Technical Service Providers
- Water Quality
- Wildlife Biology

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What is FOTG?

Technical guides are the primary scientific references for NRCS. They contain technical information about the conservation of soil, water, air, and related plant and animal resources.

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Section II -Natural Resources Information
Section III-Conservation Management Systems
Section IV-Practice Standards and Specifications
Section V -Conservation Effects

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In The Spotlight

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Updated Stream Crossing Specification

Waste Treatment Lagoon Specification (7/2/2013)
Updated Waste Treatment Lagoon Specification

Roof Runoff Structure Specification (7/2/2013)
Updated Roof Runoff Structure Specification

Roof Runoff Structure Information Sheet (7/2/2013)
New Roof Runoff Structure Information Sheet

Practice Documentation (7/2/2013)
Reposting Practice Documentation.

Waste Treatment Lagoon Statement of Work (7/2/2013)
Updated Waste Treatment Lagoon Statement of Work

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CONSERVATION PLANNING

National and State Resource Concerns and Quality Criteria					
Natural Resource Concern	**Description of Concern**	**National Quality Criteria**	**Missouri Quality Criteria**	**Measurement Units**	**Assessment Tools for Quality Criteria Evaluation**
SOIL					
Soil Erosion **Sheet and Rill**	Detachment and transport of soil particles caused by rainfall splash and runoff degrade soil quality.	Sheet and rill erosion does not exceed the Soil Loss Tolerance "T".	Same as National	*tons/acre/year* – average annual tons of erosion reduced per acre for the field or planning area/unit	• Visual assessment (pedestals, rills) • Universal Soil Loss Equation • erosion meters • Revised Universal Soil Loss Equations, Version 1and 2
Soil Erosion **Wind**	Detachment and transport of soil particles caused by wind degrade soil quality and/or damage plants.	Wind erosion does not exceed the Soil Loss Tolerance "T" or, for plant damage, does not exceed Crop Damage Tolerances.	Same as National	*tons/acre/year* – average annual tons of erosion reduced per acre for the field or planning area/unit	• Visual assessment (pedestals, blow-out areas) • Wind Erosion Equation (WEQ)
Soil Erosion **Ephemeral Gully**	Small channels caused by surface water runoff degrade soil quality and tend to increase in size. On cropland, they can be obscured by heavy tillage.	Surface water runoff is controlled sufficiently to stabilize the small channels and prevent reoccurrence of new channels.	Same as National	*tons/year* – average annual tons of erosion reduced per acre for the field or planning area/unit	• Visual assessment • Volume calculation • Client records
Soil Erosion **Classic Gully**	Deep, permanent channels caused by the convergence of surface runoff degrade soil quality. They enlarge progressively by headcutting and lateral widening.	Surface water runoff is controlled sufficiently to stop progression of headcutting and widening.	Same as National	*tons/year* – average annual tons of erosion reduced per acre for the field or planning area/unit	• Visual assessment • Volume calculation • Aerial photo trend analysis • Client records

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  - Agrichemical Mixing

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CONSERVATION PLANNING

National Handbook of Conservation Practices

Contents: **Chapter 1** **General Practice Standards Information**

CONSERVATION PLANNING

Chapter 3 National Conservation Practice Standards

Practice Name and Units	Lead Discipline	Current Standard	Practice Code
Access Control (ac)	ESD-For	9/10	472
Access Road (ft)	CED-AE	7/10	560
Agrichemical Handling Facility (no)	CED-EE	2/08	309
Air Filtration and Scrubbing (no)	CED-AQS & ESD-ARS	4/10	371
Alley Cropping (ac)	ESD-For	5/01	311
Amendments for Treatment of Agricultural Waste	CED-EE	4/13	591
Anaerobic Digester (no)	CED-EE	9/09	366
Animal Mortality Facility (no)	CED-EE	9/10	316
Animal Trails and Walkways (ft)	CED-AE & ESD-Graz Land Sp	4/10	575
Anionic Polyacrylamide (PAM) Application (ac)	CED-WME	5/11	450
Aquaculture Ponds (ac)	CED-AE & ESD-AqEco	1/10	397
Aquatic Organism Passage (mi)	ESD-AqEco	4/11	396
Bedding (ac)	CED-WME	7/10	310

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CONSERVATION PLANNING

NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

COVER CROP

(Ac.)

CODE 340

DEFINITION

Crops including grasses, legumes, and forbs for seasonal cover and other conservation purposes.

CONSERVATION PLANNING

PURPOSE

- Reduce erosion from wind and water.
- Increase soil organic matter content.
- Capture and recycle or redistribute nutrients in the soil profile.
- Promote biological nitrogen fixation and reduce energy use.
- Increase biodiversity.
- Suppress Weeds.
- Manage soil moisture.
- Minimize and reduce soil compaction.

CONSERVATION PLANNING

CONDITIONS WHERE PRACTICE APPLIES

All lands requiring vegetative cover for natural resource protection and or improvement.

CONSERVATION PLANNING

CRITERIA

General Criteria Applicable to All Purposes

Plant species, seedbed preparation, seeding rates, seeding dates, seeding depths, fertility requirements, and planting methods will be consistent with approved local criteria and site conditions.

The species selected will be compatible with other components of the cropping system.

Ensure herbicides used with cover crops are compatible with the following crop.

Ensure that plants are not listed as noxious weeds or invasive species for a particular state.

Cover crop residue will not be burned.

CONSERVATION PLANNING

Additional Criteria to Reduce Erosion from Wind and Water

Time cover crop establishment in conjunction with other practices, so that the soil will be adequately protected during the critical erosion period(s).

Plants selected for cover crops will have the physical characteristics necessary to provide adequate protection.

Determine the amount of surface and/or canopy cover needed from the cover crop using current erosion prediction technology.

CONSERVATION PLANNING

CONSIDERATIONS

Plant cover crops in a timely matter to establish a good stand.

When applicable, ensure cover crops are managed and are compatible with the client's crop insurance criteria.

Maintain an actively growing cover crop as late as feasible to maximize plant growth, allowing time to prepare the field for the next crop and moisture depletion.

When used to redistribute nutrients from deeper in the profile up to the surface layer, consider killing of the cover crop in relation to the planting date of the following crop.

If the objective is to best synchronize the use of cover crop as a green manure to cycle nutrients, factors such as the carbon/nitrogen ratios may be considered to kill early and have a faster mineralization of nutrients to match release of nutrient with uptake by following cash crop.

The right moment to kill the cover crop will depend on the specific rotation, weather, and grower objectives.

Use deep-rooted species to maximize nutrient recovery.

Use grasses to utilize more soil nitrogen, and legumes utilize both nitrogen and phosphorus.

Avoid cover crop species that harbor or carryover potentially damaging diseases or insects.

For most purposes for which cover crops are established, the combined canopy and surface cover is at nearly 90 percent or greater, and the above ground (dry weight) biomass production is at least 4,000 lbs/acre.

Cover crops may be used to improve site conditions for establishment of perennial species.

Use plant species that enhance bio-fuels opportunities.

Use plant species that enhance forage opportunities for pollinators by using diverse legumes and other forbs.

Use a diverse mixture of 2 or more species to address multiple purposes.

CONSERVATION PLANNING

PLANS AND SPECIFICATIONS

Plans and specifications will be prepared for the practice site. Plans for the establishment of cover crops shall include:

- Field number and acres
- Species or species of plants to be established.
- Seeding rates.
- Recommended seeding dates.
- Establishment procedure.
- Planned rates and timing of nutrient application.
- Planned dates and method to terminate the cover crop.
- Other information pertinent to establishing and managing the cover crop.

Plans and specifications for the establishment and management of cover crops may be recorded in narrative form, on job sheets, or on other forms.

CONSERVATION PLANNING

OPERATION AND MAINTENANCE

Control growth of the cover crop to reduce competition from volunteer plants and shading.

Control weeds in cover crops by mowing or by using other pest management techniques.

Control soil moisture depletion by selecting water efficient plant species and terminating the cover crop before excessive transpiration.

Evaluate the cover crop to determine if the cover crop is meeting the planned purpose(s). If the cover crop is not meeting the purpose(s) adjust the management, change the species of cover crop, or choose a different technology.

CONSERVATION PLANNING

US Department of Agriculture
Natural Resources Conservation Service

JS-AGRON-22
August 2012

Missouri Cover Crop Design Worksheet

Note: Yellow areas indicate required data. Blue areas indicate optional data.

Name: _____ **Program:** _____
Address: _____ **Contract #:** _____
Field No.: _____ **Contract Item No.:** _____
Section: _____ **Township:** _____ **Range:** _____ **Acres:** _____

Indicate the decision-maker's objective(s) for applying cover crop, in priority order (1, 2, 3,etc.)

_____	Reduce Erosion	_____	Provide Supplemental Hay/Grazing
_____	Biological Nitrogen Fixation	_____	Utilize Excess Soil Moisture
_____	Pest Suppression	_____	Minimize or Reduce Soil Compaction
_____	Increase Soil Organic Matter	_____	Capture Nutrients
_____	Increase Biodiversity	_____	Reduce Crop Abrasion

Design soil map unit: _____

Seeding Method: (•) Drill/Planter ( ) Broadcast ( ) Row Middles

	Existing Condition Without Cover Crop	Planned Condition With Cover Crop
Erosion rates (water, wind):		
Soil Condition Index:		

CONSERVATION PLANNING

Seeding Window: **Termination Method:**

Fertilizer Applied:

Management Considerations:	Weeds will be controlled with clipping or proper herbicides as needed following product label directions and current MU Use recommendations. Species marked with an asterisk (*) require *Rhizobium* inoculation.

Planned Cover Crop Mixture

Cover Crop Species	Full Seed Rate #/ac	Acres	Percent of Full Rate	Rate lb/ac	Total lbs	Crop Type	Seeding Depth (inches)
			0%		0.0	Total Pounds	

Estimated seeding rate (lbs/acre): **Planned Seeding Depth (inches):**

Notes:

Cover Crop Certification Worksheet

Name: _____ Program: _____

Address: _____ Contract #: _____

Site location: _____ Contract Item #: _____

Section: Township: Range: Acres Planted:

Instructions: Document producer's actual cover crop planting information below. Attach or include photos of the cover crop to this Job Sheet.

Species	Total Pounds	Plants per Sq Ft
Total Lbs:	0	

Practice Check Out Conditions

Site Preparation:

Fertility Used:

Date Planted:

Planting Depth: inches

Planting Method: Drilled Broadcast
Row Middles (circle one)

Weed Control:

Termination Method:

Cover Crop Height at Termination: inches

Irrigated: Yes No (circle one)

Notes and Comments:

Aerial Seeding of Cover Crops Information Sheet

Conservation Specification Information ***(IS-MO340)***

Seed selection

Most species of cover crops will produce adequate stands for winter and early spring soil protection when broadcast on the soil surface, provided that the proper weather and soil surface conditions are present. Cereal grains (e.g. wheat, rye, oats, barley, triticale) will easily establish by aerial seeding.

Ryegrass interseeded into corn.

Harvesting soybeans releases previously seeded cover crop.

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Section V

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- Conservation Practice Physical Effects (CPPE)
  - Introduction
  - 1. Soil
    - CPPE - Soil Condition
    - CPPE - Soil Erosion
  - 2. Water
  - 3. Air
  - 4. Plant
  - 5. Animal
  - 6. Human

FOTG Home Page

What is FOTG?

Technical guides are the primary scientific references for NRCS. They contain technical information about the conservation of soil, water, air, and related plant and animal resources.

...more

For additional information and requirements please contact your local USDA Service Center.

What's Changed Recently

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Practice Name	Practice Code	Soil Condition - Compaction	Soil Condition - Contaminants - Residual Pesticides	Soil Condition - Contaminants - Salts and Other Chemicals	Soil Condition - Damage from Sediment Deposition
Access Control	472	4	0	0	4
Access Road	560	2	0	-1	0
Agrichemical Handling Facility	309	0	0	0	0
Alley Cropping	311	2	3	2	3
Anaerobic Digestor, Ambient Temperature	365	0	0	0	0
Anaerobic Digestor, Controlled Temperature	366	0	0	0	0
Animal Mortality Facility	316	0	0	0	0
Anionic Polyacrylamide (PAM) Erosion Control	450	0	0	0	0
Brush Management	314	-1	-1	2	2
Clearing and Snagging	326	0	0	0	0
Closure of Waste Impoundment	360	0	0	0	0
Composting Facility	317	0	0	0	0
Conservation Cover	327	3	3	2	3
Conservation Crop Rotation	328	2	3	2	3
Contour Buffer Strips	332	0	0	0	4
Contour Farming	330	0	0	0	4
Cover Crop	340	2	2	1	2

CONSERVATION PLANNING

U.S. Department of Agriculture Natural Resources Conservation Service	NRCS-CPA-52 6-18-2010	A. Client Name:
ENVIRONMENTAL EVALUATION WORKSHEET		B. Conservation Plan ID # (as applicable): Program Authority (optional):
D. Client's Objective(s) (purpose):		C. Identification # (farm, tract, field #, etc as required):

E. Need for Action:	G. Alternatives		
	No Action √ if RMS ☐	*Alternative 1* √ if RMS ☐	*Alternative 2* √ if RMS ☐

Resource Concerns

In Section "F" below, analyze, record, and address concerns identified through the Resources Inventory process. (See FOTG Section III - Resource Quality Criteria for guidance).

F. Resource Concerns and Existing / Benchmark Conditions (Analyze and record the existing/benchmark conditions for each identified concern)	H. Effects of Alternatives					
	No Action		*Alternative 1*		*Alternative 2*	
	Amount, Status, Description (short and long term)	√ if does NOT meet QC	Amount, Status, Description (short and long term)	√ if does NOT meet QC	Amount, Status, Description (short and long term)	√ if does NOT meet QC
SOIL						
		NOT meet ☐ QC		NOT meet ☐ QC		NOT meet ☐ QC
		NOT		NOT		NOT

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Technical Resources

- Agronomy
- Comprehensive Nutrient Management Planning (CNMP)
- Contracting Opportunities
- Cultural Resources
- Ecoregional Planting Guides for Pollinators
- Engineering Tools and Resources
- Field Office Technical Guide (eFOTG)
- Forestry and Agroforestry
- Forms
- GPS Support
- Grasslands
- Maps, Imagery, and Data Resources
- Missouri State Technical Committee
- Missouri Wetland Mapping Conventions
- Natural Resource Data and Analysis
- Nutrient Management
- Plant Materials
- Rapid Watershed Assessments
- Reports
- Soils
- Standards - drafts
- Technical References (includes MO Technical Notes, Job Sheets, Information Sheets)
- Technical Service Providers
- Water Quality
- Wildlife Biology


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