

## CONSERVATION PRACTICE PHYSICAL EFFECTS WORKSHEET

STATE	Arkansas	FIELD OFFICE		DATE	
<b>PRACTICE: Residue Management, Seasonal 344</b>		Baseline Setting:			
		Appropriate Land Use(s): Crop			
<b>RESOURCES, CONSIDERATIONS AND CONCERNS</b>		<b>PHYSICAL EFFECTS</b>		<b>RATIONALE</b>	
<b>SOIL - EROSION</b>					
Sheet and Rill		Slight to Moderate Improvement		Managing residue to increase residue cover reduces erosion by water especially during periods of higher rainfall.	
Wind		Slight to Substantial Improvement		Managing residue to increase residue cover reduces erosion by wind.	
Ephemeral Gully		Slight Improvement		Managing residue to increase residue cover reduces erosion by water.	
Classic Gully		Slight Improvement		Residue cover may reduce runoff during critical periods.	
Streambank		Not Applicable		Not applicable.	
Shoreline		Not Applicable		Not applicable.	
Irrigation Induced		Slight to Moderate Improvement		More residue on soil surface reduces erosion	
Mass Movement		Neutral		Rooting depth could cause slight improvement. Residue may increase moisture content that may cause slight worsening.	
Road, Roadsides, and Construction Sites		Not Applicable		Not applicable.	
<b>SOIL – CONDITION</b>					
Organic Matter Depletion		Slight Improvement		Increased residue may increase organic matter.	
Rangeland Site Stability		Not Applicable		Not applicable.	
Compaction		Not Applicable		Not applicable.	
Subsidence		Not Applicable		Not applicable.	
Contaminants:					
• Salts and other Chemicals		Slight Improvement		If residue management increases organic matter salts may be buffered.	
• Animal Waste and other Organics - N		Not Applicable		Not applicable.	
• Animal Waste and other Organics - P		Not Applicable		Not applicable.	
• Animal Waste and other Organics - K		Not Applicable		Not applicable.	
• Commercial Fertilizer - N		Not Applicable		Not applicable.	
• Commercial Fertilizer - P		Not Applicable		Not applicable.	
• Commercial Fertilizer - K		Not Applicable		Not applicable.	
• Residual Pesticides		Not Applicable		Not applicable.	
Damage from Sediment Deposition		Slight to Moderate Improvement		Maintaining surface residue reduces erosion resulting in less	

		sediment.
<b>WATER – QUANTITY</b>		
Rangeland Hydrologic Cycle	Not Applicable	Not applicable.
Excessive Seepage	Slight Worsening	Increases infiltration resulting in more water moving through the profile.
Excessive Runoff, Flooding, or Ponding	Slight Improvement	Reduces runoff, ponding, and increase infiltration.
Excessive Subsurface Water	Not Applicable	Not applicable.
Drifted Snow	Slight to Moderate Improvement	The residue managed over the winter months can trap snow and add to soil moisture.
Inadequate Outlets	Not Applicable	Not applicable.
Inefficient Water use on Irrigated Land	Slight Improvement	Residue increases infiltration and decreases evaporation resulting in more available water. However, increased infiltration reduces the efficiency of furrow irrigation.
Inefficient Water use on Non-Irrigated Land	Slight Improvement	Increases water holding capacity because of better infiltration. Also will trap snow that will increase infiltration.
Reduced Capacity of Conveyances by Sediment Deposition	Slight Improvement	Increase water holding capacity because of better infiltration. Also will trap snow that will increase infiltration.
Reduced Storage of Water Bodies by Sediment Accumulation	Slight to Moderate Improvement	Residue on soil surface reduces erosion which results in less sediment.
Aquifer Overdraft	Slight Improvement	Increased infiltration may improve aquifer recharge and reduce withdrawals.
Insufficient Flows in Water Courses	Not Applicable	Not applicable.
<b>WATER – QUALITY</b>		
In Groundwater:		
• Harmful Levels of Pesticides	Neutral	Not applicable.
• Excessive Nutrients and Organics	Neutral	Not applicable.
• Excessive Salinity	Slight Worsening	Better infiltration may increase leaching potential.
• Harmful Levels of Heavy Metals	Slight Improvement	Higher organic matter levels may increase buffering capacity of the soil.
• Harmful Levels of Pathogens	Neutral	Better infiltration could increase leaching, but increased microbial activity may enhance competition with pathogens.
• Harmful Levels of Petroleum	Not Applicable	Not applicable.
In Surface Water:		
• Harmful Levels of Pesticides	Slight Improvement	The action decreases runoff and erosion.
• Excessive Nutrients and Organics	Slight Improvement	Less erosion and runoff reduces transport of nutrients.
• Excessive Suspended Sediment	Slight Improvement	Less erosion and runoff reduces

and Turbidity		transport of sediment.
• Excessive Salinity	Slight Improvement	Less runoff reduces transport of soluble salts. However increased infiltration results in more seepage which can carry soluble salts to the surface.
• Harmful Levels of Heavy Metals	Slight Improvement	Decreased erosion and runoff reduces heavy metal delivery to surface water.
• Harmful Temperatures	Not Applicable	Not applicable.
• Harmful Levels of Pathogens	Slight Improvement	Less erosion and runoff reduces delivery of pathogens.
• Harmful Levels of Petroleum	Not Applicable	Not applicable.
<b>AIR – QUALITY</b>		
Particulate Matter less than 10 Micrometers in Diameter (PM 10)	Slight to Moderate Improvement	Residue on the surface during the critical wind erosion period reduces particulate generation.
Particulate Matter less than 2.5 Micrometers in Diameter (PM 2.5)	Slight to Moderate Improvement	Residue on the surface during the critical wind erosion period reduces particulate generation.
Excessive Ozone	Neutral	There is a minimal reduction of ozone precursors through reduced surface temperatures offered by mulch material.
Excessive Greenhouse Gas:		
• CO <sub>2</sub> (Carbon Dioxide)	Slight to Moderate Improvement	Reduced use of machinery reduces CO <sub>2</sub> emissions and increases soil carbon storage.
• N <sub>2</sub> O (Nitrous Oxide)	Not Applicable	Not applicable.
• CH <sub>4</sub> (Methane)	Not Applicable	Not applicable.
Ammonia (NH <sub>3</sub> )	Not Applicable	Not applicable.
Chemical Drift	Not Applicable	Not applicable.
Objectionable Odors	Neutral	Residues will reduce wind movement and intercept VOCs, fine particulates, and fugitive dust.
Reduced Visibility	Slight to Moderate Improvement	Reduction in wind erosion potential and fugitive dust
Undesirable Air Movement	Not Applicable	Not applicable.
Adverse Air Temperature	Not Applicable	Not applicable.
<b>PLANTS – SUITABILITY</b>		
Plants not Adapted or Suited	Not Applicable	Not applicable.
<b>PLANTS - CONDITION</b>		
Productivity, Health, and Vigor	Slight to Moderate Improvement	Conserving moisture and improving soil conditions contribute to enhanced plant productivity and health.
Threatened or Endangered Plant Species:		
• Plant Species Listed or Proposed for Listing Under the Endangered Species Act	Not Applicable	Not applicable.
• Declining Species, Species of	Not Applicable	Not applicable.

Concern		
Noxious and Invasive Plants	Not Applicable	Not applicable.
Forage Quality and Palatability	Not Applicable	Not applicable.
Wildfire Hazard	Not Applicable	Not applicable.
<b>ANIMALS - FISH AND WILDLIFE</b>		
Inadequate Food	Slight to Moderate Improvement	Crop residue provides some food for wildlife.
Inadequate Cover/Shelter	Slight to Moderate Improvement	Crop residue provides some cover/shelter.
Inadequate Water	Not Applicable	Not applicable.
Inadequate Space	Slight Improvement	Residue restores some habitat/space.
Habitat Fragmentation	Not Applicable	Not applicable.
Imbalance Among and Within Populations	Slight to Moderate Improvement	Residue is managed to provide cover during critical periods.
Threatened and Endangered Fish and Wildlife Species:		
<ul style="list-style-type: none"> <li>Fish and Wildlife Species Listed or Proposed for Listing Under the Endangered Species Act</li> </ul>	Neutral	Activities are designed, installed, and mitigated to an extent to maintain or enhance species of concern.
<ul style="list-style-type: none"> <li>Declining Species, Species of Concern</li> </ul>	Neutral	Activities are designed, installed, and mitigated to an extent to maintain or enhance species of concern.
<b>ANIMALS – DOMESTIC</b>		
Inadequate Quantities and Quality of Feed and Forage	Slight Improvement	There may be some use of the residue for feed and forage by livestock.
Inadequate Shelter	Not Applicable	Not applicable.
Inadequate Stock Water	Not Applicable	Not applicable.
Stress and Mortality	Not Applicable	Not applicable.
<b>HUMAN – ECONOMICS</b>		
Land - Change in Land Use	Not applicable.	Not applicable.
Land – Land in Production	Not applicable.	Not applicable.
Capital – Change in Equipment	Slight Increase.	Some new equipment may be required for the practice.
Capital - Total Investment Cost	Slight	Some new equipment may be required for the practice.
Capital – Annual Cost	Slight increase.	Annual management costs.
Capital – Credit and Farm Program Eligibility	Situational.	
Labor - Labor	Slight increase.	
Labor – Change in Management Level	Slight increase.	
Risk - Yield	Moderate Decrease	Slight increase in short term, long-term moderate decrease.
Risk - Flexibility	Slight to Moderate Increase	Slight to moderate increase because of adoption of new technology.
Risk - Timing	Slight to Moderate Decrease	Slight to moderate decrease - longer field season.
Risk – Cash Flow	Slight Decrease	Slight decrease due to management costs.

Profitability – Change in Profitability	Situational	Slight decrease or increase.
<b>HUMAN - CULTURAL</b>		
Cultural Resources and/or Historic Properties Present or Suspected to be PRESENT	Not applicable.	Not applicable.
<b>HUMAN – ENERGY</b>		
Depletion of Fossil Fuel Resources	Slight to Moderate Decrease	Results in the reduction of tillage
Underutilization of Non-Fossil Energy Resources	Not Applicable	Not Applicable

## Human Considerations Explanation

<b>Considerations</b>	<b>Physical effects indicate:</b>
<b>Land - Change in Land Use</b>	The degree to which implementing the conservation practice is expected to cause a change from one land use to another.
<b>Land - Land in Production</b>	The degree to which implementing the conservation practice is expected to cause an increase or decrease in the amount of land in production.
<b>Capital - Change in Equipment</b>	The degree to which implementing the conservation practice is expected to cause an increase or decrease in the amount of capital equipment required for farm or ranch operations.
<b>Capital - Total Investment Cost</b>	A qualitative measure of the increase in total investment dollars required in order to implement the conservation practice.
<b>Capital - Annual Cost</b>	A qualitative measure of the expected change in annual capital costs required in order to operate and maintain the conservation practice.
<b>Capital - Credit &amp; Farm Program Eligibility</b>	Included to make conservation planners aware of the potential availability of funding for implementing conservation practices.
<b>Labor – Labor</b>	The degree to which implementing the conservation practice is likely to cause an increase or decrease in the total amount of overall farm or ranch labor required for operations.
<b>Labor - Change in Management Level</b>	The degree to which implementing the conservation practice is likely to cause an increase or decrease in the total amount of required active management on a farm or ranch.
<b>Risk – Yield</b>	The degree to which risk, as related to crop or livestock yields, is expected to increase or decrease as a result of implementing the conservation practice.
<b>Risk – Flexibility</b>	The degree to which risk, as related to the flexibility of farm or ranch operations, is expected to increase or decrease as a result of implementing the conservation practice. For example, converting from flood irrigation to a sprinkler system gives a farmer an increase in flexibility of irrigation, which results in a decrease in the level of risk associated with inflexibility of operations.
<b>Risk – Timing</b>	The degree to which risk, as related to the timing of farm or ranch operations, is expected to increase or decrease as a result of implementing the conservation practice.
<b>Risk - Cash Flow</b>	The degree to which risk, as related to cash flow in farm or ranch operations, is expected to increase or decrease as a result of implementing the conservation practice.
<b>Profitability - Change in Profitability</b>	The degree to which farm or ranch profitability is expected to increase or decrease as a result of implementing the conservation practice.
<b>Cultural Resources and/or Historic Properties Present or Suspected to be Present</b>	The degree to which implementation of the conservation practice is expected to increase or decrease the risk of cultural resource disturbance, degradation, or loss.
<b>Depletion of Fossil Fuel Resources</b>	Inefficient use of fossil-originated energy sources (diesel, gasoline, propane, natural gas, coal), lubricants, and other materials.
<b>Underutilization of Non-Fossil Energy Sources</b>	Available and cost-effective alternative energy sources (solar, wind, biofuel, hydroelectric, geothermal) are not being used or are being used inefficiently.