

Table of Contents

	<u>Page</u>
<u>Climate</u>	
Climate Update - Fall, 1993 and Winter, 1994 .....	1
Soil Moisture, 1993 .....	3
Soil Freeze - Thaw Occurrences .....	6
Variability of Climate .....	8
<u>Becker</u>	
Nitrogen Management for Irrigated Potatoes: Effects of Nitrogen Timing and Source on Soil Nitrate Movement and Petiole Sap Nitrate Interpretation - 1993 .....	10
Phosphorus Requirements for Potatoes on Sandy Soils - 1993 .....	21
Evaluation of Potassium Sources for Potato Production on Sandy Soils .....	28
Tillage Induced Microrelief Impacts on Nitrate Movement in Soils, Becker and Westport, MN .....	32
<u>Lamberton</u>	
Long Term Nitrogen Management Effects on Corn Yield .....	37
Nitrate Losses to Tile Drainage, Residual Soil N and N Uptake as Affected by Cropping Systems ....	39
Organic Crop Rotation Study on the Koch Farm at the Southwest Experiment Station, Lamberton .....	45
Variable Input Crop Management Systems: Evaluation of Productivity, Profitability and Energy Efficiency .....	48
Tillage Management for Increasing Crop Yields and Decreasing Soil Erosion at the Southwest Experiment Station .....	57
The Effect of Tillage Systems on Soil Bulk Density and Long-Term Crop Yields at the Southwest Experiment Station .....	60
<u>Morris</u>	
Weather Summary - 1993, West Central Experiment Station .....	63
Long-Term Corn-Soybean Tillage .....	64
Matching Precision Placement of Potash Fertilizer to Root Growth in a Ridge Till System .....	65
Estimation of Direct and Residual N Availability From Applied Liquid Swine and Dairy Manure .....	69
Assessment of the Effects of Tillage and Manure Application on Sediment and P Loss Due to Runoff .....	74

Staples

Potassium Fertilization of Alfalfa Grown on an Irrigated Sandy Soil .....	84
Establishment of Forage Legumes on Sandy Soils in North-Central Minnesota .....	86
Evaluation of Best - Management of N on Irrigated Potatoes: Yield and Nitrate Losses .....	89
Carrot Response to Fertilizer on an Irrigated Sandy Soil .....	94
Tillage, N Rate, Row Cultivation, and Inoculation Effects on Stand Establishment, Nodulation, Incidence of White Mold, and Yield of Red Kidney Beans .....	97
Nitrogen Source Effects on Corn/Potato Yield and Nitrate Leaching .....	103

Waseca

Weather Data - 1993, Southern Experiment Station Waseca, Minnesota .....	108
1993 Soil Moisture .....	109
Nitrogen Loss to Tile Lines as Affected by Previous Tillage Systems .....	100
Nitrate Losses to Tile Drainage as Affected by Nitrogen Fertilization of Corn in a Corn - Soybean Rotation .....	113
Nitrogen Fertilization of Established Reed Canarygrass .....	119
Impact of Adding Wheat to a Traditional Corn - Soybean Strip System on Crop Yields, Erosion Control and Pest Infestation .....	123
Decline Rates of Soil Test P and K in a Corn-Soybean Rotation .....	127
Development of a Soil N Test in Animal - Based Systems .....	131

Westport

Impact of Turkey Manure Application on Corn Production and Potential Water Quality Concerns .....	133
---	-----

Off Station ResearchForage Legumes

Evaluation of Liming Materials and Rate of Application for Alfalfa Production on Irrigated Sandy Soils .....	Wadena Co. ....	138
Evaluation of Rate of Lime Needed for Optimum Production of Five Legumes in North - Central MN .....	Wadena Co. ....	141
Determining Potassium Requirements of Alternative Legumes .....	Todd Co. ....	144
Sulfur Fertilization and Growth of Forage Legumes .....	Wadena Co. ....	146

Nutrient Management

Matching Plant Population and Fertilizer Management for Profitable Corn Production.....	Goodhue Co. ....	148
Use of In-Season NIR Plant N Test to Predict N Requirements for Hard Red Spring Wheat .....	Northwestern MN ....	154
Improving Fertilizer Recommendations for Production of Edible Beans in Minnesota .....	Staples Irrigation Center and Renville Co. ....	157
The Evaluation of Broiler Manure and Fertilizer Nitrogen on Potato Yield and Quality .....	Sherburne Co. ....	159

Farming By Soil

Site Specific Management of Corn Hybrids and Plant Populations .....	162
Site Specific Crop Management: N - Serve Responses at Hildreth Site 1993 .....	165
Site Specific Crop Management: N - Response by Soil Condition at Hildreth Site 1993 .....	172
Evaluation of a Variable Tillage Implement on Corn and Soybean Yields .....	177
Performance of a Variable Tillage Implement in Corn Residue .....	182
Performance of a Variable Tillage Implement in Soybean Residue .....	187

Agronomic Utilization of Waste Materials

Municipal Solid Waste Compost Use on Agricultural Soils .....	Sand Plain Research Farm, Becker and Staples Irrigation Center ....	191
Land Spreading of Yard Waste .....	Sand Plain Research Farm, Becker MN ....	201
Land Treatment of Sewage Sludge Incinerator Ash, 1993 ....	Rosholt Research Farm, Westport MN ....	210
Agricultural Utilization of Nutralime: On Farm Demonstration Plots - 1993 .....	Dakota, Isanti and Washington Co. ....	219

Tillage

Effects of Tillage and Liquid Dairy Manure on Nitrogen Availability to Corn and Infiltration .....	Goodhue Co. ....	238
Tillage Comparison at Rosemount, Rosemount, 1993 .....		243
The Effect of Tillage System and Soil Type on the Yield of Corn and Soybeans on Soils Developed in Glacial Till .....	Rice Co. ....	249
Integration of Manure and Alfalfa N Sources into Residue Management Systems for Karst Areas of MN .....	Southeast MN ....	252
Evaluation of Residue Management System for Corn, Soybean and Wheat Production .....	West-Central ....	267