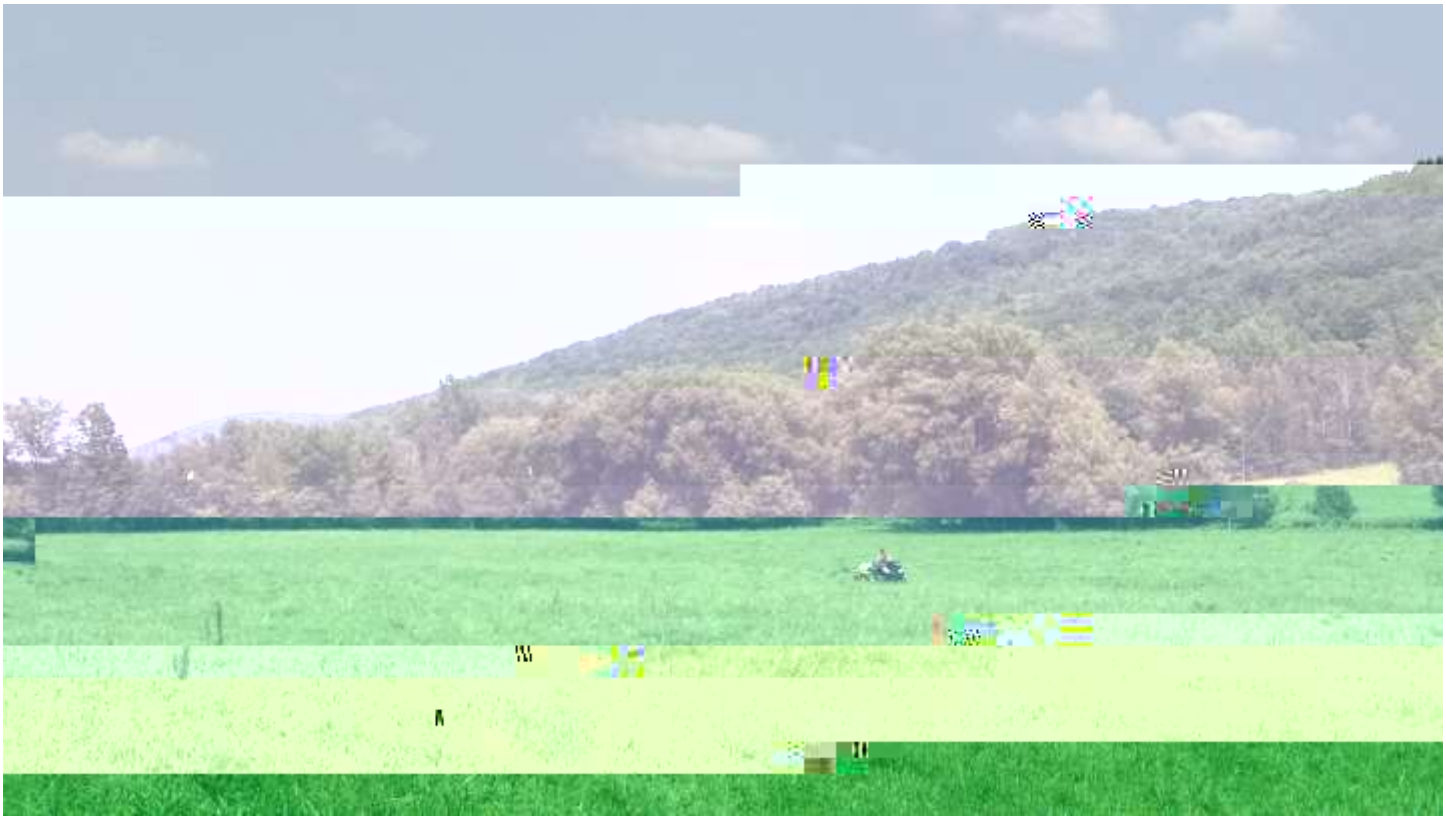
NORTHWEST CROPS & SOILS PROGRAM

2015 Pasture Productivity Trial



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2015 PASTURE PRODUCTIVITY TRIAL

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INTRODUCTION

Pasture is an essential component of feed for dairy cattle on organic farms. Productivity of pastures is essential to ensure the cattle have a plentiful source of high quality feed during the entire grazing season. Optimal management of pastures should include animal, plant, and soil factors. This project aims to identify weak links in the pasture system and evaluate the impact of adopting new strategies to overcome barriers to productivity. In this case, soil fertility and species diversity were identified as the weak links to productivity.

The pasture where this research took place was seeded to grass about 30 years ago and prior to that had been used for corn silage. For the last 10 years, the pasture has been minimally fertilized with a spring or fall manure application at a rate of 3000-4000 gal ac^{-1}. Based on soil test information, the pasture was low in potassium (K). The pasture consisted primarily of grass with low diversity and a very low percentage of legumes. This species scenario substantially increases the pasture demand for nitrogen (N). The long-term strategy to improve yield and quality included over-seeding the pasture to improve species diversity and ultimately providing higher yields and quality. A goal was to increase legume percentage to minimize the need for N in the pasture system. Base fertility consisting of manure/compost was added in the fall. Low levels of supplemental fertility sources were also added throughout the season to try and boost production at a low cost. Data was collected throughout the growing season to determine the impact on pasture productivity and costs associated with implementation of practices.

MATERIALS AND METHODS

The trial was conducted at Holyoke Farm located in St. Albans, VT. The experimental area included 18 acres of pasture that were grazed by 60 cows using management intensive grazing techniques. General plot management is shared in Table 1. Cows were given approximately 1 acre of pasture, representing 1 paddock, for every 24 hours that they grazed. There were two treatments that included fertility/seeding and a control where no additional fertility or seed was applied. The fertility/seeding treatment was seeded with a grass/legume mix, fertilized with 52 lbs ac^{-1} of K and 6.6 lbs ac^{-1} N.

To boost species diversity, the following forage mix was overseeded into the established pasture: 5 lbs ac^{-1} each of HDR meadow fescue, Kentucky bluegrass, Preval meadow fescue, and Liherold meadow fescue, and 2 lbs ac^{-1} each of TFL chicory, Freedom red clover, Dynamite red clover, Kopu white clover, and Ladino white clover, totaling to 30 lbs ac^{-1}

were projected to be 150 lbs ac^{1}. The 52 lbs ac^{-1} K applied may have had a greater impact on the pasture productivity.

Table 3. Pasture yield and quality of the fertilizer and control treatments, shown by each grazing cycle, 2015.

	CP	NDF	NE_L	RFV	Yield
	% of DM	% of DM	Mcal lb^{-1}		tons/acre
Cycle 1: 7-Jul 2-Aug					
Control	13.7	54.5	0.59	109	3388
Fertilizer	16.8	52.1	0.60	122	2859
p-value	0.46	0.78	0.83	0.61	0.55
Cycle 2: 6-Aug 3-Sep					
Control	18.3	47.3	0.65	132	3074
Fertilizer	17.2	47.6	0.64	130	2344
p-value	0.54	0.90	0.70	0.89	0.06
Cycle 3: 9-Sep 2-Oct					
Control	19.8	52.0	0.59	115	1610
Fertilizer	20.9	43.3	0.67	152	1611
p-value	0.48	0.01	0.01	0.03	0.99

Table 4. Pasture yield and quality of the fertilizer and control treatments, shown across grazing cycles, 2015.

	CP	NDF	NE_L	RFV	Yield
	% of DM	% of DM	Mcal lb^{-1}		tons/acre