

On-Farm Nutrient Management and Reduction Projects

PROJECT FACT SHEET

Project Title: Alternative forage crops for phytoremediation of soils containing high levels of dairy manure phosphorus (P) and nitrogen (N)

Project Lead: Texas Agricultural Experiment Station

Project Website: <http://stephenville.tamu.edu/~jmuir/dairy.htm>

Funding Sources: Texas Agricultural Experiment Station

Project Partners: Tarleton State University / Texas Cooperative Extension

Project Description: Dairy manure P has been and continues to be over-applied on crop fields adjacent to dairies or abandoned dairies. This can result in excessive P, Nitrogen (N) and organic matter runoff into surface water in the North Bosque. A series of field trials identified alternative forage crops whose yield and herbage mineral concentration combined to remove high levels of both N and P.

Project Benefits: Benefits include remediation (hay or silage removal) of hyper-P/N-saturated soils, thereby avoiding both present and future contamination of surface water.

Project Schedule: 1998-2004

Project Status: Data analyzed and published in:

Muir, J.P., S.R. Stokes, T.J. Butler and R.M. Jones. 2001. Selecting forage systems to improve phosphorus cycling within confined animal feeding operations. Proc. American Forage and Grassland Council, Springdale AR, April 22-25, 2001. 10:252-256.

Nguluve, D., J.P. Muir, R. Wittie, R. Rossiere and T.J. Butler. 2004. Yield and Quality of Summer Legumes as Influenced by Dairy Manure Compost and Crabgrass. Agronomy Journal 96:812-817.

Muir, J.P. 2002. Hand-plucked forage yield and quality and seed production from annual and short-lived perennial warm-season legumes fertilized with composted manure. Crop Science 42:897-904.

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Muir, J.P. 2001. Effect of dairy compost application, variety and stand age on kenaf forage yield, nitrogen content and phosphorus uptake. *Agronomy Journal* 93:1169-1173.

Sanderson, M.A., R.M. Jones, M.J. McFarland, J. Stroup, R.L. Reed and J.P. Muir. 2001. Nutrient movement and removal in a switchgrass biomass-filter strip system treated with dairy manure. *Journal of Environmental Quality* 30:210-216.

Muir, J.P., S. Stokes and E. Prostko. 2001. Production, quality and phosphorus uptake of summer annual grasses grown as alternative silages with dairy compost. *Journal of Professional Animal Science* 17:90-94.

Muir, J.P., S. Stokes and E. Prostko. 2001. Production, quality and phosphorus uptake of summer annual dicots grown as alternative silages with dairy compost. *Journal of Professional Animal Science* 17:95-100.

Bow, J.R., J.P. Muir, and D. Weindorf. 2004. Competition between established switchgrass swards interseeded with annual winter legumes with and without dairy compost. Oct.31-Nov. 4, 2004, Seattle WA. *Agronomy Abstracts* (on CD).

Bow, J.R., J.P. Muir, and D. Weindorf. Competition between established switchgrass swards interseeded with annual winter legumes with and without dairy compost. Manuscript submitted to *Agronomy Journal*.

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