

# The North Central Quarterly

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## NCES Builds Portable Calving Shelters

James J. Boedicker

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Two portable calving shelters were built by this station in early 1997 for demonstration and use at our Beef and Forage Research Farm located just south of Grand Rapids. Impetus for the shelters came from former station animal scientist Dr. John Hall, who was familiar with the use of this type of shelter in the western U.S. and Canada and believed they could be of value to the research program here as well as of interest to Minnesota producers. Such shelters are a relatively low cost alternative for providing protection during adverse weather for cows calving on pasture and can also serve other management related needs for both cows and calves. Besides being movable to where they are needed, another advantage is that they can be moved when necessary to clean areas and thus help minimize disease transmission.

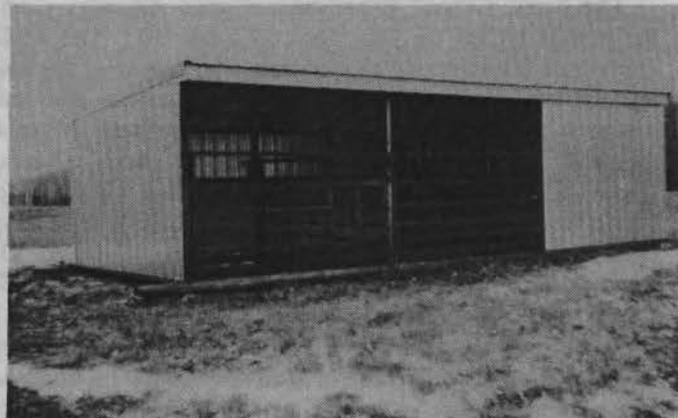
Before deciding whether and how to build the units, we reviewed plans for a "Portable Pipe Frame Calving Shelter" available through the Canada Plan Service and also information on similar units available commercially. We then made a preliminary cost estimate on materials to build our own. The estimate was favorable and, with confidence in the ability of station personnel to build the units, we decided to proceed with more detailed design, material procurement and construction. Building the units ourselves provided the opportunity to incorporate some of our own preferences into the design. It also gave us experience useful in advising any beef cow/calf producers interested in building similar units for themselves. Our design objective was to achieve the best possible compromise on utility, overall quality, cost and ease of construction. The final plan emerged after considerable analysis of alternative structural designs and material choices, availabilities, costs, etc.

Because the structures were being built in February and March, it was necessary to do most of the construction indoors where some heat was available. The only place available at our research site was an equipment storage area on one end of a laboratory building located there. Maximum dimensions of the calving shelters were thus limited by building interior width and width of the overhead door opening. Most of the steel construction (cutting, welding, etc.) was completed inside. Units were then pulled outside for roof framing and installation of steel siding and roofing.

The shelters each have three pens or stalls, each about 10 ft x 11 ft in size. Two adjacent pens have gates on the front but are essentially open; the third has a closed front. The partition between the enclosed pen and the middle pen has a headgate and a crowding gate. The crowding gate is built with separate upper and lower sections that can be either locked together or unlocked and the lower section moved to allow the calf to easily nurse the cow if confined in the headgate. The headgate can be used from either direction. The other partition consists of a solid portion and a gate hinged from the rear. One front gate has a section that can be opened to allow passage only by calves. Vertical clearance

inside the units is 8 ft in the front and 7 ft in the rear.

More critical parts of the design were based on analysis of loadings while others were based solely on "judgement." The shelters are supported on two 34 ft long skids made of 5 inch, Sch. 40 pipe. All other wall framing, upper and lower cross ties, and gates consist of steel pipe or square tubing of selected sizes and weights. The roof consists of 2"x6" rafters, 2 ft apart (adequate for a snow load of a full 30 lb/sq ft) and 2"x4" perline (flat), 2 ft apart. Inside walls are lined to 4 ft above the skids with 3/4 inch plywood that protects the siding and also provides considerable stiffening for the structure. Siding and the entire roof system provide additional stiffening. Other bracing was considered but not installed.



Each shelter weighs about 6500 lbs. By comparison, a snow load of 30 lb/sq ft would total over 11,000 lbs. Needless to say, in winters like our last two, it could be necessary at times to clear the roof before attempting to move the structure! Another concern was risk of overturn in high winds, which in this case depends mostly on weight and geometry of the structure. Based on Midwest Plan Service, methods for calculating wind forces, the structures should be stable in winds up to about 70 to 80 mph, roughly equivalent to State Building Code requirements for buildings in this part of Minnesota. Material and supply costs for the structures were about \$2,500 each. Actual construction time was estimated to be about 120 hours per unit.

Detailed construction plans for our portable calving shelters are nearing completion and will be available to the public soon. The shelters are located at our research farm on Harristown Road, south of Grand Rapids. Those wishing to inspect the structures can call this station at 218/327-4490. I want to thank four individuals, Doug Hendrickson, Keith Mann, Tom Carey and Conrad Herman for their efforts in building the calving units. Their skills, dedication and creativity were important to the successful completion of the units.

This archival publication may not reflect current scientific knowledge or recommendations.  
Current information available from University of Minnesota Extension: <http://www.extension.umn.edu>.

# North Central Alumni Update

Tom Carpenter

Another successful North Central School of Agriculture All-Class Reunion was held on July 19. A great turnout of 130 attended the events. Tours of Minnesota Power, NCES and the Horticulture Area were popular; in fact we were getting pushed at lunch break for time! The afternoon show by Port-of-Call went over well - we had comfortable seating and all could hear. Hopefully everyone got their share of strawberries and ice cream! The room that we had for our evening dinner and entertainment was just the right size. The first prize of the evening went to Vernon Nelson, Hibbing, MN, Class of 1929, for being the oldest alumnus attending. Hope you can attend many more reunions Vernon! Throughout the evening nothing but good comments were heard about how well the committee put this reunion together. Those attending elected the same committee to put the next reunion together, so make plans for July 22, 2000 to spend the day at North Central with lots of socializing and entertainment. If you have anything you would like included in the next reunion, feel free to

send suggestions to me.

I would like to tell you about the **Horticulture Campaign**. As most of you know, I have been an employee of North Central for 35-1/2 years and have spent most of that time in the Horticulture Department, so my heart and soul are in horticulture research. As Dave Rabas, Station Head, mentioned at our alumni dinner, a **Horticulture Campaign** would be starting this fall. The campaign is a special effort to raise \$50,000 by the beginning of the next century to support horticulture research. Horticulture research at NCES consists of • small fruits • annual and perennial flowers • tree fruits and • warm season vegetables. The horticulture research program, as part of the NCES mission, is "discovering and sharing knowledge to improve the quality of life of the people of Minnesota." For more information about the campaign, contact Dave Rabas, Dave Wildung or Joe Rust at NCES.

Hope you all have an enjoyable and healthy winter.

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## Advisory Committee Meets

The North Central Experiment Station Advisory Committee met at NCES on Thursday, October 30. The advisory committee is comprised of members who represent the various agricultural, horticultural, wild rice, tourism and natural resource producers and industries in northern Minnesota. Current committee members include John Gunvalson (Gonvick), Margaret Haapoja (Bovey), Bart Heitke (Mora), Kevin Hoge (Aitkin), Dan Jordan (Chisholm), Willy Lindquist (Kelliher), Tim O'Hara and Bob Olen (Duluth), David Radaich-Vice Chair (Goodland), George Scherzer (White Earth) and Allen Jackson-Chair, Chris Peterson and Dan Rupert (Grand Rapids).

The committee's purpose is to advise the station on research and outreach needs, to serve as a contact with producers, industry and consumer groups throughout the state and to be a source of support with the legislature and other important groups. The committee heard reports on the station budget, capital requests and research and outreach programs. Staff members presented brief summaries of current research activities and initiatives. Readers are encouraged to contact advisory committee members to share ideas for research and educational programs and to identify ways in which the station can improve services to our customers.

### Future Events at NCES

- January 14 & 15 - Annual Conference of the Minnesota Cultivated Wild Rice Growers-Grand Rapids Sawmill Inn.
- February - Cow/Calf Management Days-Date to be announced. Watch for the February Quarterly and separate mailings for program schedule.

## Kosbaus Present Gift

Harold and Betty Kosbau are shown presenting a check to Dave Rabas, Station Head (left) to support wild rice research at the University of Minnesota. One half of the \$20,000 gift is to be added to the Frank D. Kosbau Memorial Fund. Frank Kosbau, brother of Harold, was a respected Waskish and Aitkin area farmer and a pioneer in the wild rice industry. The memorial endowment fund established in his name in 1990 has grown to over \$120,000 and has provided important funding to the University's wild rice research program.



Half of the Kosbau gift is to establish an endowment fund on behalf of their son, Hal. Income from the Hal E. Kosbau Memorial Fund is to be used to provide a scholarship for a graduate or undergraduate student at the University of Minnesota to conduct research in soil science related to wild rice. Hal Kosbau graduated from the University of Minnesota in 1981 with a major in Soil Science. Harold, Betty and Hal's son, Nathaniel, will be recognized for their contributions at a special University Foundation celebration in December.

Thanks to the Kosbau family and for their many friends in the wild rice industry for their generous support of wild rice research at the University of Minnesota.

# Kura Clover - Grass Mixtures Under Grazing

Russell Mathison, Agronomist

Kura clover is a spreading perennial legume originating in Caucasian Russia. It has many traits which could be very useful in helping to increase the profitability and sustainability of grazing systems. One of the challenges in these systems has been to identify species or varieties of perennial legumes which can persist under grazing. Alfalfa, red clover and birdsfoot trefoil are used extensively in grazing systems, but do not have true long-term persistence. Kura clover has an extensive root and rhizome system, making it very winter-hardy and tolerant of severe continuous grazing. It is adapted to a diversity of soils, tolerating low fertility, soil acidity and wet soils. It survives drought because of its deep root system. Kura clover forage grazed by livestock is primarily leaves and is very high in nutritive value. It has excellent long term carrying capacity and gain/acre potential. Kura clover has poor seedling vigor, thus is difficult to establish, and typically may not reach full forage production until the second year after seeding. Also, kura clover grown in pure stands can induce bloat in ruminants. A common practice to reduce the incidence of bloat is to grow bloat-inducing legumes in mixtures with grasses. Acceptable legume:grass mixtures usually contain 40 to 60 percent legume. The objective of this research was to evaluate Kentucky bluegrass, orchardgrass, reed canarygrass and timothy for use in mixtures with kura clover and to investigate the use of birdsfoot trefoil for weed control and to enhance seeding and first production year dry matter yields. Of the four cool-season grasses evaluated in this research, Kentucky bluegrass and reed canarygrass appear to be the most suitable to plant in mixture with kura clover, based on legume:grass ratio and forage dry matter yield. Orchardgrass tends to dominate kura clover, especially in more northern locations characterized by cool, wet growing condition, and timothy lacks the persistence desired in long-term, sustainable grazing systems.



Sheep grazing forage plots at 16-20 inch height.

'Endura' kura clover appears to be a somewhat more vigorous variety than 'Rhizo', based primarily on legume:grass ratio data from the kura clover/orchardgrass mixtures. In these mixtures, 'Endura' consistently comprised a larger proportion of the harvested forage than did 'Rhizo'. A logical explanation for this may be that 'Endura' is somewhat more aggressive.

Kura clover may be very useful in grazing systems. Results from these experiments supported claims it is persistent under grazing conditions. Both experiments will be maintained for information on long-term persistence and productivity. Productivity of kura clover may be initially lower than other commonly used legumes, however the cost savings by not having to reseed every three to five years should compensate for lower initial productivity. Planting a noncompetitive legume such as birdsfoot trefoil with kura clover may be an option to increase initial forage dry matter yield, but further investigation is necessary to support this option.

Treatments	Botanical composition at final harvest						Dry Matter Yield		
	15 August 1994			11 September 1995			1994	1995	1996
	Kura	Grass	BFT	Kura	Grass	BFT	TDM/A		
				-% <sup>1</sup>					
Rhizo + Climax Timothy	4	96	-	35	60	-	2.05	2.89	2.55
Rhizo + Ventura Reed Canarygrass	25	75	-	32	50	-	1.64	3.05	2.44
Rhizo + Park Kentucky Bluegrass	49	51	-	42	52	-	1.61	3.31	3.20
Rhizo + Orion Orchardgrass	4	96	-	10	80	-	2.52	3.68	2.88
Rhizo + Timothy + Norcen BFT	7	63	30	43	37	20	2.25	2.93	3.17
Rhizo + Reed Canarygrass + BFT	17	39	44	33	40	27	1.38	3.31	2.33
Rhizo + Kentucky Bluegrass + BFT	7	40	53	33	35	32	1.48	3.63	2.45
Rhizo + Orchardgrass + BFT	8	62	30	13	62	25	2.03	3.57	2.67
Endura + Timothy	27	33	-	85	12	-	2.43	3.34	3.15
Endura + Reed Canarygrass	39	61	-	57	43	-	1.83	3.72	2.95
Endura + Kentucky Bluegrass	60	38	-	74	23	-	1.49	4.18	3.23
Endura + Orchardgrass	15	85	-	20	77	-	2.24	4.28	3.22
Endura + Timothy + BFT	23	66	31	72	15	13	2.21	3.71	3.42
Mean	22	62	38	42	45	23	1.94	3.51	2.90
LDS (0.05)	23	39	31	13	22	ns	ns	.81	ns

<sup>1</sup>Difference between % composition sum of Kura, Grass and Birdsfoot trefoil and 100% is % weeds.

# News from North Central

David L. Rabas, Head

In my July Quarterly column I was hoping for a warm August and a late frost to allow time for full season crops like tomatoes and corn to mature. I got half my wish! According to Art Elling, weather recorder at the USDA Forestry Sciences Laboratory, August temperatures were slightly below normal, but the first fall frost didn't occur until October 10. This is the latest date on record for a fall frost and allowed the 1997 growing season to tie for the longest growing season on record (5/21 to 10/10 equals 142 days).

On July 21 we were honored to have new University of Minnesota President Mark Yudof visit our community and the North Central Station on one of his first trips outstate since becoming U president. Thanks to many fine efforts on the part of our staff, the visit was very productive. President Yudof has made a significant effort to get to know the people and economy of our state and has been very supportive of agriculture and natural resource research and education programs.

In spite of reoccurring budget retrenchments, we are continuing to look forward to improving our capacity to provide research and education services to the people of Minnesota and our region. As I write, the ground is shaking from a trencher installing fiber optic cable to connect the rest of our NCES campus to high speed computer services such as e-mail and the internet.

Our capital request to correct ADA (Americans w/Disabilities Act) deficiencies in our administration building and to add additional office, conference room and meeting room space is moving forward to the legislature. These new facilities will provide the potential to bring increased access to the programs and services of the University of Minnesota to the people of northern Minnesota. We look forward to the possibility of providing credit and noncredit classes, outreach programs, multi-site extension programs and other educational opportunities through an interactive television studio in the new facility. We are excited about exploring the possibility of

collaborating with area two year and four year colleges to offer coordinated credit classes and degree programs partially supported by new interactive classroom technologies. If you have a chance to talk to your local legislator, please ask for his/her support for our capital request to help bring University of Minnesota services and collaborative opportunities to our area.

As Tom Carpenter indicated in his alumni column we are in the process of developing/conducting a campaign to raise funds to support our horticulture research and outreach programs. The campaign "Growing into the 21st Century" is an effort to raise \$50,000 by the beginning of the 21st century. I hope many of our readers will consider supporting this effort.

Congratulations to Ray Steffen. Ray will complete 25 years at NCES in December. Ray joined our staff on December 12, 1972 as an Assistant Farm Animal Technician. He currently serves as a Farm Animal Attendant in our beef cow/calf research program. We appreciate Ray's past service and wish him many more productive years at NCES.

Winter will be here about the time this issue of the Quarterly reaches your home or office. I look forward to visiting with many of you during our winter meetings. Until then, please accept my best wishes for a happy holiday season and an enjoyable and rewarding new year.

*Season's Greetings!*

*from*

*The Staff at NCES*



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