

FIELD PEAS MAKE EXCELLENT QUALITY FORAGE FOR BEEF CATTLE

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We know that field peas are a highly palatable grain for all classes of livestock and are a nutrient dense energy and protein source. Less well known is the nutritional value and palatability of field peas harvested as forage. Field peas or the popular field pea-cereal grain mixes can be harvested as hay or silage early enough in the cropping year to potentially allow for a second later season crop. Winter wheat following pea forage is a logical and popular cropping sequence. Conversely, pea seed left in the field after harvest that is lightly tilled in, may grow enough in the fall to harvest forage by grazing animals or possibly harvesting the crop as silage.



Dr. Anderson

Forage trials at the Carrington Research Extension Center (Table 1) indicate peas make excellent quality hay when harvested alone with a relative feed value of 146 with nearly 17% protein. Growing mixed stands of peas and oats or barley for forage increased hay yields from 2.29 tons per acre for straight peas to 2.55 tons for oat- or barley-pea mixes.

The true test of the value of forage is measured in animal performance, with the quality of forage being more critical in young animals. Trials at

the NDSU Carrington Research Extension Center compared pea hay, pea-barley hay, pea residue, and grass hay as the control in rations for weaned steer calves fed to market weight. A two month growing phase include ~30% forage in 55 Mcal NEg rations followed by a 3.5 month finishing period with ~15% forage in the 62 Mcal NEg rations. The rations included barley, corn, and distiller's grains as well as appropriate supplements. Calves tended to eat more of the pea hay and pea-barley hay rations just after weaning. Gains during the growing phase strongly favored the pea hay and pea-barley hay diets by 0.67 and 0.53 pounds per day over the grass hay diet. The advantage during finishing was reduced as there was less forage in the ration. Feed efficiency tended to favor all the pea forage diets. Carcass traits were similar but the percent choice in the two pea forage diets was 79 and 82 percent compared to 67 and 60 in the control and pea residue rations.



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Table 1. Forage production and nutritional value of field pea and/or cereal grains* (3yr avg).								
	DM Yield Tons/acre	Hay Yield 15% Moist	Silage Yield 40% DM	Protein %	TDN %	RFV		
Field Peas	1.95	2.29	4.88	16.95	67.37	145.57		
Barley	1.78	2.09	4.45	9.74	64.08	126.76		
Field Peas/Barley	2.18	2.56	5.45	13.65	65.12	132.75		
Oats	1.78	2.1	4.45	9.44	60.58	116.09		
Field Peas/Oats	2.17	2.55	5.42	12.48	62.94	118.74		
*adapted from S. Zwinger, Carrington Per Ext Center Appual Penert, 2011								

"The cattle really like pea-oat silage. It has been easy to start the cattle on feed compared with last year when the diets were corn silage based." Sebastian Estrada, Meyer Ranch, Morristown, SD





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second crop of forage or possibly sunflowers. Peas will improve soil tilth and fix nitrogen. Peas or pea-cereal mix planted as forage can contribute to a profitable integrated croplivestock farming operation.

While this paper presents pea forage information, the value of pea grain continues to be recognized in various feeding programs that include dairy, horses, bison, sheep, swine, and pets. With increased demand for peas as feed comes increased competition for pea grain. Feed manufacturers include peas for their binding properties for pelleting commercial feeds. Seedstock producers like peas in diets for

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growing breeding bulls and "high end" companion animal foods often include peas.

Regional producers have also experienced the benefit of field pea forage mix. "Pea-oat forage has lots of positives. It's a different source of protein and energy with multiple benefits to the soil and the cattle. I would say that intake was very satisfactory in the period oat-pea mix was fed." Sebastian Estrada, Meyer Ranch, Morristown, SD.

The value of peas for feeds is recognized throughout the world. We help feed the world from right here in the Northern Plains, how is that for a noble profession?

Complete trial results can be found in the 2011 North Dakota State University Carrington Research Extension Center Annual Report.



Table 1. Comparison of nutrient value of livestock feed grain with field peas.						
Item	ield peas	Corn	Barley			
Dry matter, %	89	88	88			
	% Dry Matter					
Crude protein, %	25.5	9.8	13.2			
Total digestible nutrients, %	87.0	90.0	85.0			
NEg, Mcal/lb	0.67	0.68	0.63			
Rumen undegradable protein, %	30.0	60.0	27.0			
Calcium, %	0.15	0.03	0.05			
Phosphorus, %	0.44	0.31	0.35			
Fat,%	1.40	4.30	2.20			
Adapted from Anderson et al., 2007. AS-1301 and NRC, 1996.						

Table 2. Field pea grain, pea co-products and pea forage nutrient analysis.									
Item	Pea Grain	Pea Hulls	Pea Screenings	Pea Hay	Pea Straw	Pea Silage			
Dry matter, %	88	92	90	88	89	35			
·	% Dry Matter								
Crude protein, %	25.5	9.0	23.6	13.6	8.5	15.4			
Total digestible nutrients, %	87.0	60.0	80.0	58.0	46.0	58.0			
NEm, Mcal/lb	1.02	0.59	0.88	0.56	0.38	0.57			
NEg, Macl/lb	0.67	0.33	0.59	0.27	0.13	0.31			
Calcium, %	0.15	0.48	0.14	1.39	1.62	1.32			
Phosphorus, %	0.44	0.09	0.48	0.28	0.11	0.22			

Adapted from Lardy et al., 2009. Alternative Feeds for Ruminants. AS-1182 p. 21.

BENEFITS OF GROWING FIELD PEAS Blaine G. Schatz, Director NDSU CREC

The introduction of field pea to North Dakota and Montana in the mid-1990's provided an important new crop option for producers. The biology of this coolseason legume makes it particularly suited to the region. Lentils were previously grown on very limited acres but field pea production increased rapidly to significant production levels. Field peas benefit cropping systems and provides flexibility within a farm enterprise. Peas are primarily grown for grain, but producers can use the residue for cattle feed or graze regrowth with beef cattle. Peas grown for forage produce excellent quality hay or silage, with or without a cereal grain mix, or peas can be grazed as part of a cover crop. Peas are amazingly cold tolerant, continuing to grow at temperatures down to 26°F.



Legumes work well in crop rotations as they fix atmospheric nitrogen. Field peas are one of the more efficient annual legumes for nitrogen fixation and work very well in small grain rotations versus longer term dedication of acreage required by

alfalfa. Properly inoculated field peas should not require commercial nitrogen fertilizer and will reduce the amount applied to the following crop. When field pea acreage first expanded, the crop was used in rotation with annual cereals including spring wheat, durum and barley. Another benefit of field pea in crop rotations is to break plant disease cycles associated with annual cool season cereal grains.

The benefit of growing peas that is likely the most appreciated by producers is the response of crops planted on fields where peas were grown the previous year. Crops following peas generally produce a significantly greater yield compared to the same crop planted after other crop options. This positive recrop response has been documented in a number of crop rotation trials including multiple studies at the NDSU Carrington Research Extension Center (http://www.ag.ndsu.edu/CarringtonREC/). The reasons for the favorable performance of crops grown after field peas are not always clear. The positive response is likely associated with nitrogen fixation, repressing diseases, and potentially other factors including improved soil texture. More research is needed to define this effect.

The positive aspects of a crop and it's rotational benefits may be overlooked or under-appreciated when profit margins exceed historic levels. When growing conditions and per acre profits are more challenging, a crops inherent benefit to the overall farm enterprise becomes more readily recognized and embraced. Field pea is a crop that can benefit producers through the highly variable growing seasons in the Northern Plains.

"Pea-oat silage is highly palatable, and easy to incorporate in growing and finishing rations. When I took sick cattle out of the pens to the hospital pen, I fed one bucket of pea-oats and another bucket of corn silage. They will always eat the peas first." Sebastian Estrada,

Sebastian Estrada, Meyer Ranch, Morristown, SD





INCREDIBLE FEED INGREDIENT

Value of peas

Field peas are an excellent feed for all classes of cattle. Peas digest slowly and thoroughly, maintaining stable rumen conditions. Peas have the same



energy value as corn with nearly three times the protein. Based on the nutrients in a 56 lb. bushel of corn, a 60 lb bushel of peas is worth 125 to 140% a bushel of corn. Field pea co-products, (chips, splits, and screenings) easily compete with other feed grains for value.

Cow calf

Field peas are an excellent feed grain for beef cows needing some extra energy and protein anytime during the year. Peas are a very palatable, digestible, and nutrient dense grain. Peas are very palatable and digestible in creep feeds. Cows and calves like

peas. In addition to grain, peas make excellent quality hay when grown with oats or barley. Pea residue can also be fed to cows.

Weaning and feedlot

Our research at the NDSU Carrington Center observed that weaned steer calves fed peas ate more and gained nearly half a pound more per day than calves not fed peas. Replacement heifers can use up to 20%

peas in their forage based rations. And the best news; peas in finishing rations improved the tenderness and juiciness of ribeye steaks, based on scientific taste panel studies at NDSU, making pea fed beef the very best beef possible!

Peas for bulls

Leading seedstock producers throughout the Northern Plains are using peas as an energy and protein source in their growing rations for young bulls at approximately 15% of the ration. They report exceptional muscle development, fewer feet and leg problems, and more satisfied animals. This is testament to the feed value of field peas. Peas digest slowly and thoroughly and support a stable rumen environment.

For more information on using peas as feed, visit www.northernpulse.com



For sources and other info see www.northernpulse.com

Written by Dr. Vern Anderson, Animal Scientist, Breanne Ilse, Research Specialist and Blaine Schatz, Director from NDSU Carrington Research Extension Center.

"My Angus bulls seem to be more complacent when I include peas in the growing ration" Justin Spickler, Spickler Angus, Glenfield, ND.

