

3D Fencing: Keeping Wildlife Away

“Once you tighten up the wires, it’s amazing to see the 3-dimensional effect with the two fences.”

Bill Wilson,

What is it & how does it work?

3D fences are used to defer wildlife, mainly elk, deer and moose. It is composed of 2 fence setup that compels wildlife to stop and look before jumping. Since the fence is composed of height, depth and width (hence 3D), wildlife tend to be more careful and will approach with caution.

This is because the eyes of deer, moose and elk are placed on the side of their head, giving them poor depth perception. The key now is to have your fence electrified so when they check it out with their sensitive noses, they receive a powerful shock that leaves them looking for another trail, feeding place or bed.

Quick Facts:

- ⇒ Fences can be permanent or portable.
- ⇒ Have been used in gardens, nurseries, orchards, vineyards, tree farms, etc.
- ⇒ Scent caps can be used to entice wildlife to touch the fence with their sensitive noses.

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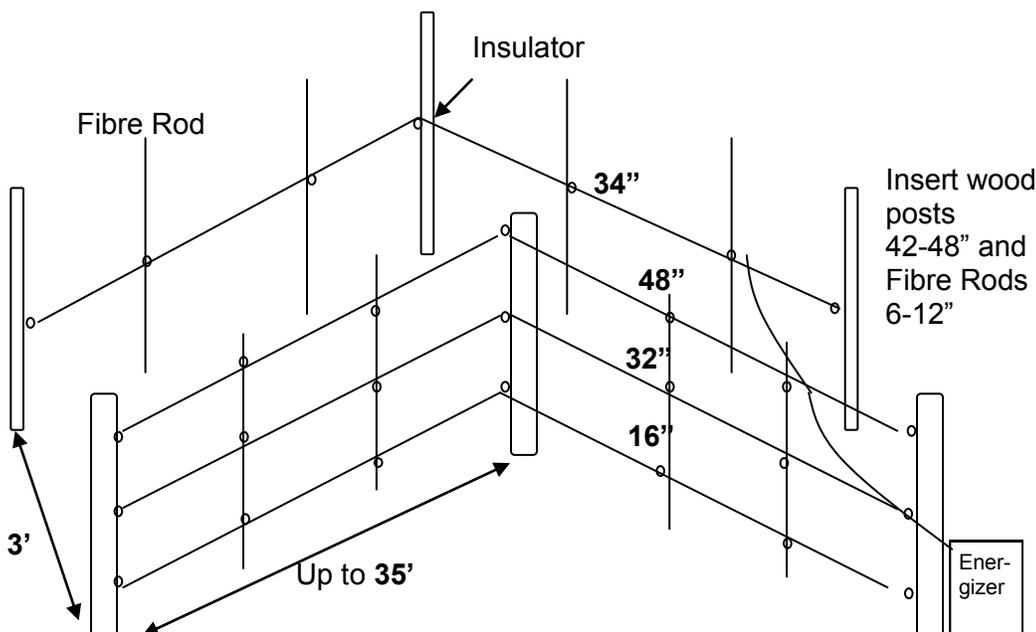
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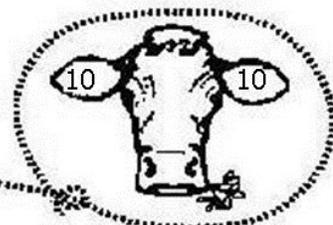
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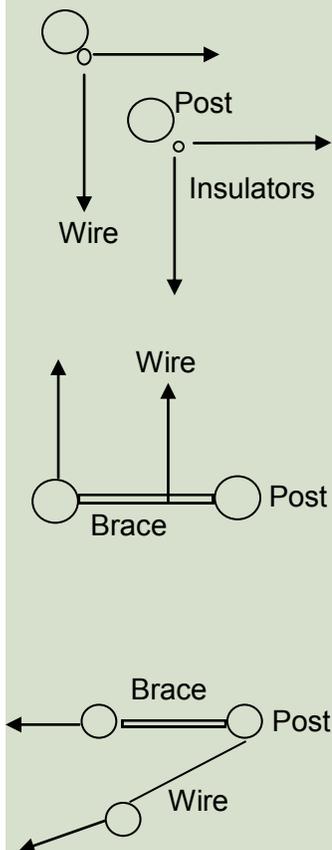
3D Wildlife Fence Diagram



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The Corner of Corners:



Posts can be either wooden or fiberglass

Tried and True Fences



Slant fence design from Grave Creek, Montana



3D fence Tim and Linda Ewert's organic market garden in Pouce Coupe, BC



Adding inside fence to exiting fence line at Sandra Burton's in winter 2009

Cooperators & Objectives

- Rick Kantz:** to keep deer out of grain bags
- Bill Wilson:** to keep elk out of winter feeding or swath grazing fields
- Glenn Hogberg:** to keep moose & deer out of stackyard
- Perry & Corinne Spitzer:** to keep deer out of hay yard
- Sandra Burton:** to keep deer, moose & stallions out of winter feeding area

Our Project Plans

The next step in the 3D Fencing project is to help cooperators design and build their own permanent or portable fence and document how well it deters wildlife from stack yards or grain bags. We are also working towards a design that can be built in the middle of winter for winter feeding or swath grazing.

Some things we may try are:

- ⇒ extending the distance between the 2 fences to 4 ft instead of 3 ft

- ⇒ staggering the posts on the first and second fence line
- ⇒ allowing the wire on the outside fence to be moveable, so when there are large snowfalls, the height of the wire can be adjusted to maintain the "3D effect"

We are also eager to hear ideas for gates as this is the weakest part of our fence. Please feel free to contact the association if you wish to brainstorm with us!

Compiled by: Talon Johnson in Aug 2010.

3D Wildlife Fencing Project Funding Partners:

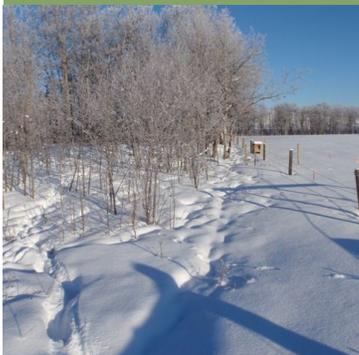
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Does It Pay? 3D Wildlife Fencing



“The 3D fence redirected the wildlife around the yard. I feel the fence was definitely cost effective in keeping the wildlife out of the grain bags.”

*Rick Kantz,
Montney, BC*

Objectives

The objectives of this forage fact are to share preliminary information about the costs and benefits of 3 D fencing at the first 4 demonstrations. To refresh our memories, these 4 demos are in cooperation with Rick Kantz, Glenn Hogberg, Bill Wilson and Sandra Burton. More detail can be found in previous Forage Facts (#52 to #55), mailed out to members with the newsletter, or on the forage website (see link below).



The 3 dimensional effect of the wildlife fencing around Bill Wilson's pasture.

Does It Pay? Costs of 3D Wildlife Fencing

3D Fence Construction	Kantz	Hogberg	Burton	Wilson
Type of demo	Grain bag yard	Hay stackyard	Winter feeding	Swath grazing
Size of demo	100' x 120'	155' x 66'	20 ac	160 ac
Cost of posts	\$190	\$140	\$400	\$1000
Hardware costs: wire, insulators, gate handles, corner bracing	\$400	\$300	\$440	\$1000
Use of energizer	\$200	\$200	\$200	\$200
Labour & equipment	\$1400	\$1500	\$2400	\$3500
Total construction cost	\$2190	\$2140	\$3440	\$5700
Cost per ft of 3D fence	\$5.00	\$4.84	\$1.00	\$0.54
Construction cost/ yr (spread over 5 yr)	\$440	\$430	\$690	\$1140

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Assumptions in:**Grain bag calculation:**

\$12/bu for canola
 \$8/bu for wheat
 \$4/bu for feed barley
 250' long grain bags

Stackyard calculation:

\$40/ round bale
 \$4 / round bale trucking
 & unloading

Horse hay calculation:

\$4/ sq bale
 \$0.75/ bale for delivery

*** Note:** Cost here includes only cost of replacing bales not lost opportunity cost of choice of where to winter feed & place manure urine & nutrients or the increased corral cleaning costs.

Does It Pay? Benefits of 3D Wildlife Fencing

Type & Detail of Potential Loss	Kantz	Hogberg	Burton
Type of loss without 3D fence	Grain & grain bags	Cattle feed in hay stackyard	Horse hay bales
Total potential loss	10 bags x 250	150 round bales	200 sq bales
Extent of loss	2.4 bu per ft of bag length	20 - 25 %	20 -30 %
Replacement cost of lost grain (feed barley), lost feed for cattle or horses	\$24,000 per 10 grain bags	\$1200-\$1500	\$160-\$240
Cost of labour, equipment & trucking		\$120-\$150	\$30-\$45
Total benefits of 3D fences per yr	\$24,000	\$1350 - \$1650	\$190-\$285
Compared to total fence cost per yr	\$440	* \$430	* \$690

Assumptions in**Swath grazing calculation:**

300 head of cattle

200 total days winter feeding OR
 150 days swath grazing
 +50 days bale feeding

\$120/ac for inputs to seed & fertilize oats, seeding equipment & land rent

\$0.80/head/day swaths
 \$0.10/head/ day fence

38 lb hay/ head/ day
 \$1.30/head/day bales
 \$0.30/head/day tractor

Type & Detail of Potential Loss**Wilson**

Type of loss without 3D fence	Swath grazing
Total potential loss	300 head x 150 days
Extent of loss	150 days swath grazing
Replacement cost of lost feed or lost opportunity to swath graze oats	\$58,500 (300 hd x \$1.30 x150 days)
Cost of labour, equipment & trucking	\$13,500
Feeding bales for 200 days OR	\$96,000
Swath grazing 150 days + feeding bales 50 days	\$65,500
Total benefits of 3D fences per yr	\$30,500
Total benefits of 3D fence per cow per yr	\$101 per cow
Compared to total fence cost per yr	* \$1140

Compiled by: Sandra Burton in April 2011.

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Winter Feeding with 3D Wildlife Fence

“ After we set up the first 3D fence demo, I could picture putting these fences up around larger winter feeding areas.”

*Bill Wilson,
Dawson Creek, BC*

Objectives

A series of demos of 3 D (three dimensional) fencing were set up at the Burton Kabzems 20 acre pasture near the Kiskatinaw River wildlife corridor. The objectives of these demos were to:

1. Determine if a fence could be constructed mid winter in reaction to a wildlife problem in stored hay.
2. Expand the demo to keep wildlife out of winter feeding area.
3. Experiment with different fence construction systems to see which worked the best.
4. Keep urine, manure, nutrients and fiber in the field to improve the thin grey wooded soil.
5. Improve summer pasture productivity and resilience to drought.
6. Improving horse health by keeping them out of confined corral area longer.



Air photo illustrating location of 3D fencing demo in a 20 ac pasture near the Kiskatinaw River wildlife corridor.

- ➔ Historic wildlife traffic
- Demo around bales in Feb 2010
- Demo around winter feeding area
- Improvements for 2011

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Other Forage Facts in this series about 3 dimensional wildlife fencing:

FF# 52: 3D Wildlife Fencing Keeping Wildlife Away

FF# 53: Grain Bags with 3D Wildlife Fencing

FF# 54: Stackyards with 3D Wildlife Fencing

FF#55: Winter Feeding with 3D Wildlife Fencing

Future Forage Facts:

Swath Grazing with 3D Wildlife Fencing

Slant Fencing

Costs & Benefits of 3 D Wildlife Fencing

Field Days

The central location of this demo provides great opportunities for field days and sharing the successes & challenges of these fencing systems.

Rob Davidson & Julie Robinson demonstrate how to put up Powerflex posts & insulator system (photo to right).



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Insulated powerflex posts & pin attachments for wire were a good option for mid winter fencing.

Set up of 3D wildlife fence

In Feb, 2010 an inside line of fence was added 3' in from the existing electric fenceline. Powerflex posts (72") were used and holes were drilled for the pins to attach the electric wire.

Corners were braced by running wires back to existing wooden posts (see photo to left).

Which gates worked?

Metal portable corral panels were used the 1st winter. This was a quick mid winter solution but the gates were the weakest part of the fence. In the 2nd winter, 3 different gates were tried. Overhead wire did not work well for horses and electrified bungee gates did not work well in colder temperatures. Of all the gates, the system of a gate handle with smaller gauge electric wire worked the best.



Two lines of Powerflex fencing installed in summer fall 2010 (center of photo).

Also pictured (on left side of photo above) are electrified bungee gates which worked extremely well for summer grazing but seem to sag and not hold their shape with snowfall and colder temperatures.

Fencing Description	Cost
Posts (20 ac pasture)	\$470
Hardware: wire, gates, gate handles, bracing, insulators, tighteners	\$430
Total Cash Costs *	\$900

* labour, equipment & fencer not included in costs here.

Did the 3D fences keep the wildlife out?

Diverting wildlife and changing historic habits is a learning process for both the animals and the fencer. From monitoring tracks, most deer and moose seem to be approaching the outside of the fence and diverting along it.



What next?

Despite a busy road, a few deer & moose seem to be jumping into the pasture over old barb wire fence on the north side, so 3D electric fence will be added in 2011. A 3rd inside wire will be added, and easier way to raise bottom wire when snow is deep.



Wildlife tracks diverted by 3D fence

Compiled by: Sandra Burton in Feb 2011.

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Stackyard with 3D Wildlife Fence

*" I feel the 3 D wildlife
enabled us to keep
urine and nutrients
where we need it most."*

*Glenn Hogberg,
Progress, BC*

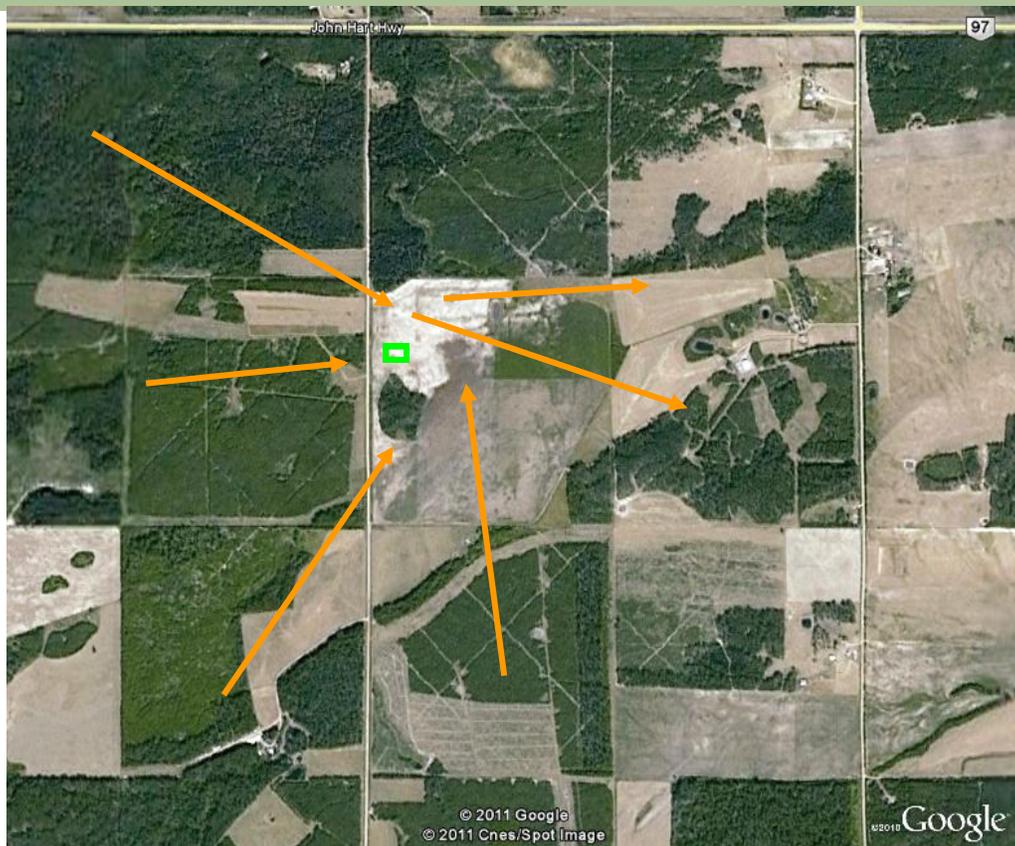
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Damage to stackyard with-
out 3 D fence (*photo below*)



Air photo illustrating location of Hogbergs' 3 D fencing demo 
In relation to wildlife traffic. 

Original Objectives

The aerial view (*photo above*) illustrates the location of the 3 D fenced area for the hay stackyard in relation to the corridors of wildlife traffic. Glenn had the following objectives in mind:

1. Keep wildlife out of hay stackyard.
2. Keep weeds contained in the hay field where they came from.
3. Keep urine, nutrients and fiber in the field to improve the thin grey wooded soil's productivity.
4. Manage herd size to match the feed available from this field.
5. Explore the cost effectiveness of 3D wildlife fencing.

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How was the 3D fence set up?

In Sept, 2011 Glenn built a 3 dimensional wildlife fence at the edge of one of his hayfields to keep moose, deer and elk out of his stackyard area (*photo below*).

Corners were made using 7' posts on the inside and 6' posts on the outside, with a diagonal wire brace. 3 strands of high tensile wire were put at 48", 32" and 16". Plastic tubing left over from an under floor heat project were an inexpensive way to insulate corners (*photo to left*). A portable reel of electric tape was used for the outside fenceline at 34" high. A 10 year old Gallagher 12 volt fencer with a solar panel was used to electrify all 4 wires. The fencer had the ability to put out 6000 to 7000 volts.

How were the gates setup?

Metal portable corral panels were used, but the gate seems to be the weakest part of the fence. Next year Glenn will probably used a gate similar to that described in Forage Fact #53.

How much did this fence cost?

The enclosure was 100' by 120'. The total cost for posts, and all hardware, (including wire, insulators, corner bracing, gate handles, tighteners) was \$440. The cost of labour and equipment such as a post pounder and the use of the electric fencer also need to be included to understand the true actual costs.

A future **Forage Fact** will discuss the costs and benefits of all the 3D wildlife fencing demos in more detail.



Did it keep the wildlife out?

Glenn reports that "For the 60 days that we fed our cattle from this stackyard, there were no tracks inside the enclosure and there was no feed loss." (*see photo to left*).

Where to next?

Glenn feels that this demo was definitely worthwhile and he wants to do this again next year. He also wants to experiment with different gates.

The 3D Wildlife Fencing Project will continue to share the results with various demos in the Peace River Region in Forage Facts and at upcoming events.

Compiled by: Glenn Hogberg and Sandra Burton in Feb 2011.

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Grain Bags with 3D Wildlife Fence

"I feel the fence was definitely effective in keeping the wildlife out of the grain bags."

*Rick Kantz,
Montney, BC*

Original Objectives

In the 2009 season, Rick Kantz of Bickford Farms experienced damages to his grain bags (see photos at left).

Wildlife hooves puncture the bags, letting in air and water, causing grain to spoil. This spoilage causes lower quality grade and income; while increasing handling logistics and costs.



Aerial view of Bickford Farms' grain storage area and:
— location of 3 D fencing demo
— wildlife traffic patterns



Wildlife damage to grain bags in 2009



Setting up the demo

In 2010, Rick built a 3 dimensional wildlife fence to keep wildlife (moose, deer and elk) out of his grain bags. The aerial view (photo above) illustrates the location of the fenceline in relation to the grain storage area and the creek corridors of wildlife traffic. Photo to right shows corner bracing.



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Starting with the fencer

Rick used a Gallagher M1500 fencer with 15 joules, that can be shut off anywhere on the line (photo to left). This fencer can ramp up to 15 joules or self regulate in response to the load on the fence line. When not loaded it runs at 3 joules and puts out 8500 volts. Using a powerful fencer enabled Rick to use the easier cheaper pin insulators.

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How was the 3D fence constructed?

Wooden fence posts were used throughout for both lines: 7' x 3-4" posts were used for the corners, and 6' x 2-3" posts were used for the fence lines. All 3 wires on the inside line and the 1 wire on the outside line are energized. Since Rick uses a powerful 15 joule fencer, putting out 3 joules consistently, no insulators were needed, and the Powerflex pins were used.

Two types of corners are compared here: one with no bracing and several with 10 ft bracing posts and wire.

On an existing 4 strand barb wire the top wire was pulled off so that the top height for the outside fence was 34".



How were the gates setup?

There were gate handles attached to all 3 inside wires and the outside wire. A finer 14 gauge wire was used for gates to prevent coiling and kinking when open, that happens with hi tensile.

How much did this fence cost?

The total cost for posts, and all hardware, (including wire, insulators, corner bracing, gate handles, tighteners) was \$500. The cost of labour and equipment such as a post pounder and the use of the electric fencer also need to be included to understand the total costs. A future **Forage Fact** will discuss the costs and benefits of all the 3D wildlife fencing demos.



Gate setup at Bickford Farms



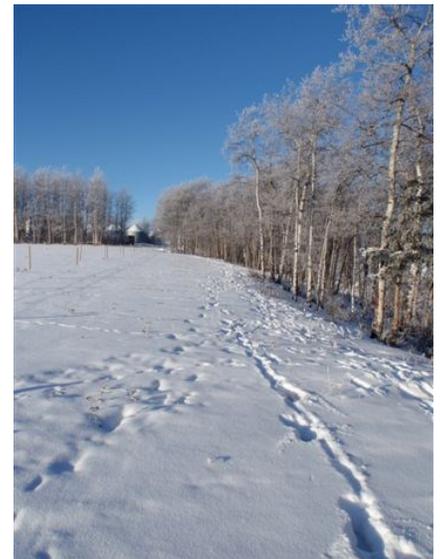
Did it keep the wildlife out?

For the 90 days that Bickford Farms fed from the grain bags, there were many tracks around the fence, especially on the line next to the creek corridor (see *photo to right*). But only twice were there tracks inside the fence, once when the gate was inadvertently left open and again when a tree fell down onto the gate. Rick says "we did see one deer in it once, but there wasn't enough snow to piece together the how and why it got into the enclosure."

Where to next?

Rick recognizes that coexisting with wildlife is a training process. Next he will try moving bales into the enclosure. He also wants to experiment with different methods of grounding.

The 3D Wildlife Fencing Project will continue to share the results with various demos in the Peace River Region in Forage Facts and at upcoming events.



Compiled by: Rick Kantz and Sandra Burton in Feb 2011.

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