

Profits soar



TEAM EFFORT: Gabe Brown (second from left) worked closely with Burleigh County, N.D., Natural Resources Conservation Service staff (left to right) Joshua Dukart, Jay Fuhrer and Ken Miller to increase profits and improve soil health.

By LON TONNESON

GABE Brown used to figure that 70-bushel corn and 7 to 8 tons of haylage were good crops on his ranch near Bismarck, N.D.

That would have put the net profit at \$20 to \$25 per acre.

But since he has added cover and companion crops to his no-till cropping system, his yields and profits have soared.

He's grown 140-bushel-per-acre corn worth \$1.65 per bushel and turned cattle out on the stalks to generate a net profit of \$219 per acre.

With corn now worth \$3.50 per bushel, the net profit would be more than \$430 per acre.

He's chopped 17 tons of haylage from a forage barley/red clover mix for a net profit of \$395 per acre.

He's chopped 15 tons of haylage per acre of a field pea and hairy vetch mix

Key Points

- Gabe Brown's profits rose with the addition of cover crops to his ranch.
- High organic matter reduced the need for commercial fertilizer on corn.
- Companion crops combined for high forage yields.

and fall grazed the regrowth for a net profit of \$450 per acre.

Brown says the cover crops:

- improve soil health and fix nitrogen
- increase organic matter and water infiltration rates
- reduce evaporation and soil temperatures
- utilize the full growing season by harvesting more sunlight

Check out his expense and income figures for several crops from recent years below:

How cover crops saved the day

GABE Brown planted his first cover crop almost in desperation in 1998. After suffering a drought and two years of 100% hail loss, he couldn't afford to buy fertilizer and chemicals. He had already seen how adding legumes to his tame grass pastures had improved the grass and increased beef production. So he planted hairy vetch with field peas rather than leaving the land idle.

"I didn't have much to lose," Brown recalls.

Brown chopped the peas for silage and the vetch regrew, producing 2 tons of haylage per acre. The following year's corn crop yielded well with only the addition of starter fertilizer.

Brown was hooked.

Field pea and vetch

Expense	\$ per acre
Land rent	25
Seed inoculant	2.25
Pea seed 90 lbs./a	13.50
Vetch seed 12 lbs./a	12
Seeding	12
Windrowing	10
Chop and haul	42
Packing @ 50 cents/ton	8
Silage inoculant	12.48
Total per-acre expense	137.23
Income	
15.2 ton/a x \$25/ton	\$380/a
(16 ton/a - 5% spoilage=15.2 ton/a)	
LDP	\$52/a
Fall grazing	\$18.17/a
(71 pair x 24 days x 80 cents divided by 75 acres)	
Total per-acre income	\$450.17
Net income	\$312.94

Forage barley and red clover

Expenses	\$ per acre
Land rent	25
Spring burndown	7.50
Barley seed, 2 bu./a	12

Red clover, 6 lbs./a	6
Seeding	12
Urea 100 lbs.	13
Windrowing	10
Chop and haul	31.74
Packing @ 50 cents/ton	8.50
Silage inoculant @ 78 cents/ton	13
Total per-acre expense	\$138.74

Income	
Yield 16.15 tons x \$22/ton	\$355.30
(17 ton/a minus 5% spoilage = 16.15 ton/a)	
LDP	\$18.20/a
Fall grazing	\$22.20/a
(185 head x 21 days x 80 cents/140 acres)	
Total per-acre income	\$395.70

Net income \$256.96 per acre

Corn

Expenses	\$ per acre
Rent	25
Alfalfa burndown	
& application	16.97
Rolling-land leveler	10
Manure - 15-20 tons/acre	7.50
Seed - 23,500 population	43.85

Fertilizer, 175 lbs. of 20.5-32-5	24.33
Planting	14
Crop insurance - 65% level	8.47
Chemical and application	13.66
Combine and hauling	22
Total per-acre expense	\$185.78
Note: Alfalfa burndown \$16.97/a and rolling \$10/a are one-time expense	

Income	
173 bushels @ \$1.65/bushel	\$285.45
LDP @ 44 cents x 173 bushels	\$76.12
Total per-acre income	\$361.57
Less total expense	\$185.78

Net income \$175.79

Note: Fall grazing would have increased income. No value figured for residue.

Corn was harvested as earlage Aftermath was grazed

83 bred yearling heifers for 47 days	
83 x 47 days = 3,901 grazing days	
3,901 x 70 cents/day = \$2,731	
62 acres grazed	
Value of aftermath grazing	\$44.04/acre

Why Brown's plan works

SEVERAL things are driving the cropping/grazing system that Gabe Brown has developed, says Jay Fuhrer, district conservationist with the Burleigh County Natural Resources Conservation Service. He and other NRCS staff have been working with Brown and other producers on the cover crop system.

■ **No-till.** No-till allows the good things produced by cover cropping to accumulate to a point where the system moves toward sustainability. "When we were using tillage with cover crops, it's as if we took a step forward by planting the cover and a step back when we worked the ground. We really weren't getting anywhere," he says.

■ **Soil organisms.** The combination of forage, grain, cover crops and companion crops has dramatically increased beneficial organisms in the soil by providing a diverse food source.

■ **Evaporation and temperature management.** NRCS staff have documented the impact no-till cover crops have on soil surface temperatures. On a day when it was 86 degrees F, the soil temperature on bare ground was 115 degrees F. The temperature of soil covered with residue and a cover crop was 76 degrees F. Research shows when the soil temperature reaches 140 degrees F, soil bacteria die. At 130 degrees F, 100% of the moisture is lost through evaporation and transpiration. At 100 degrees F, 15% of the moisture is used for growth, 85% of the moisture is lost through evaporation and transpiration. At 70 degrees F, 100% of the moisture is used for growth.

■ **Water infiltration.** Deep rooting cover crops and tunneling earthworms open channels in the soil for water to flow.

■ **Companion crop effect.** It's clear that some plants grow better together than separately. It can be seen clearly in Brown's pasture when the tame grasses next to legumes increase in biomass and seed production. The same thing seems to happen with forage crop combinations.

■ **Longer growing season.** Cover crops help you harvest more sunlight during the growing season. For example, biennials will break dormancy in the spring long before a field can be seeded and stay alive until freeze up, while annual cover crops can be seeded immediately after an early harvest.

More options

Better harvesting options is another reason that the system has worked well, Brown says. He can combine, hay, chop or graze most of the cover crops and field crops that he grows.

"I do what's best for the soil resource first," he says, "because the resource is what sustains the operation."

Next, he selects the most profitable harvest option. "It gives me a lot of flexibility," he says.