

Small Grain Silage: Estimated annual revenue, operating & fixed cost, and net returns per acre (No-till).

Budget 88-5

July-08

Description	Unit	Price	Quantity	Value	Your Farm
Operating Inputs Pre-Harvest					
-Lime, applied, pro rated share	Ton	\$38.00	0.33	\$12.54	
-10-20-20, dry bulk	Cwt.	\$30.70	2.50	76.75	
-30% N Solution	Cwt.	\$19.75	3.50	69.13	
-Fert. Spread, custom	Cwt.	\$1.75	6.00	10.50	
-Seed	Bu.	\$15.00	1.50	22.50	
-Herbicide, Burndown	Acre	\$6.50	1.00	6.50	
-Other	Acre	\$0.00	0.00	0.00	
-Other	Acre	\$0.00	0.00	0.00	
-Machinery Labor (From Table 2)				8.39	
-Other Labor	Hours	\$9.00	0.00	0.00	
-Machinery Fuel, Maint, Repairs (Table 2)				10.68	
-Miscellaneous, e.g., soil test	Acre	\$1.00	1.00	1.00	
-Operating Capital Interest ^b	\$	7.5%	72.66	5.45	
Total Pre-Harvest Operating Costs				\$223.44	
Operating Inputs for Harvesting^a					
-Harvesting Machinery Labor (From Table 2)	Acre			5.15	
-Other Labor	Hours	\$9.00	0.00	0.00	
-Harvesting Machinery Fuel, Maint, Repairs (Table 2)	Acre			10.25	
Subtotal Harvest Operating Costs				\$15.40	
-Transporting Labor (From Table 2)	Acre			14.62	
-Harvesting Machinery Fuel, Maint, Repairs (Table 2)	Acre			22.13	
Subtotal Transporting Operating Costs				\$36.75	
-Filling/Packing Machinery Labor (From Table 2)	Acre			7.72	
-Other Labor	Hours	\$9.00	0.50	4.50	
-Filling/Packing Machinery Fuel, Maint, Repairs (Table 2)	Acre			9.39	
-Cover, pro rated share	Sq. foot	0.045	60	2.70	
Subtotal Filling/Packing & Covering Op. Cost				\$24.31	
Total Harvest Operating Costs				\$76.46	
Silo & machinery housing maintenance (from Table 2)				4.00	
Total Operating Costs				\$303.90	
			Amount	Value	
Fixed Costs From Table 1					
= Machinery Depreciation, Taxes, Ins. & Interest					
-Pre-Harvest				14.55	
-Harvesting				22.15	
-Transporting				27.69	
-Filling/packing & covering				3.50	
-Silo & machinery housing				35.56	
Total Fixed Costs				\$103.46	
Land Rent ^c	Acre			0.00	
Total Cost				\$407.35	
	Unit	Price	Quantity^d	Value	
REVENUE^e					
Small Grain Silage	Ton	\$45.00	9.0	405.00	
Total Revenue				\$405.00	
COST PER TON AS MADE OR AS SOLD				\$45.26	
COST PER TON OF DRY MATTER (DM)	Dry matter %		33%	\$137.16	
COST OR RETURNS ABOVE TOTAL OPERATING COST PER ACRE				\$181.56	
RETURNS ABOVE ALL SPECIFIED COSTS PER ACRE				-\$2.35	

^a Harvesting expense includes transporting silage to the silo, filling or packing and sealing the silo.

^b Interest on operating expenses for an average of 4 months.

^c Land rent is not normally included in an enterprise budget but is appropriate for a contract grower using rented land.

^d If the silage is for your own use or is for sale as pickled silage, use the estimated quantity of pickled silage produced per acre, after allowing for fermentation and spoilage losses. Loss estimates vary from 5% to 50% with 10% to 20% most common.

^e Only include revenue if the silage crop is sold. If so, use the price and quantity as sold (field chop or pickled silage)

Table 1. Initial investment in specialized equipment and annual ownership expenses

Operation and Item	Horse Power	Life Years	Initial Cost \$	Salvage Value \$	Depreciation ^a \$	Interest ^b \$	Tax & Ins. ^c \$	Annual D.I.T.I. \$	Annual Use Hours	D.I.T.I. per Hour \$	Acres per Hour No.	Expense per Acre ^d \$	Times Over ^e No.	Total Expense \$/Acre
Rate Charged, percent =====>						7.50%	0.14%							
Land preparation														
Tractor, HP=	55	10	20,500	6,355	1,415	1,007	29	2,450	500	4.90	3.5	1.40	0	0.00
+ Chisel plow		10	3,050	1,007	204	152	4	361	100	3.61	3.5	1.03	0	0.00
Tractor, HP=	35	10	16,500	5,115	1,139	811	23	1,972	500	3.94	5.4	0.73	0	0.00
+ Disc		10	4,050	1,215	284	197	6	487	100	4.87	5.4	0.90	0	0.00
Tractor, HP=	35	10	16,500	5,115	1,139	811	23	1,972	500	3.94	5.4	0.73	0	0.00
+ Harrow		10	1,375	413	96	67	2	165	100	1.65	5.4	0.31	0	0.00
Tractor, HP=	35	10	19,700	6,107	1,359	968	28	2,355	500	4.71	11.1	0.42	1	0.42
+ Sprayer		10	3,030	1,212	182	159	4	345	100	3.45	11.1	0.31	1	0.31
Planting														
Tractor, HP=	75	10	29,600	9,176	2,042	1,454	41	3,538	500	6.00	5.1	1.18	1	1.18
+ Planter/drill		10	21,000	8,400	1,260	1,103	29	2,392	50	47.84	5.1	9.38	1	9.38
Weed control														
Tractor, HP=	35	10	16,500	5,115	1,139	811	23	1,972	500	3.94	11.1	0.36	1	0.36
+ Sprayer		10	3,700	1,480	222	194	5	421	100	4.21	11.1	0.38	1	0.38
Other Pre-harvest														
Tractor, HP=	55	10	20,500	6,355	1,415	1,007	29	2,450	500	4.90	1.0	4.90	0	0.00
+ Implement		10	0	0	0	0	0	0	100	0.00	1.0	0.00	0	0.00
Pickup Truck, 3/4 Ton		10	25,600	6,400	1,920	1,200	36	3,156	500	6.31	10.0	0.63	4	2.52
Harvesting														
Self-propelled, HP=	450	5	246,000	61,500	36,900	11,531	344	48,776	150	325.17	14.0	23.23	0	0.00
Tractor, HP=	75	10	29,600	9,176	2,042	1,454	41	3,538	500	7.08	2.1	3.37	1	3.37
+ Pull Harvester		10	32,000	8,000	2,400	1,500	45	3,945	100	39.45	2.1	18.78	1	18.78
Transportation														
Truck, used		5	20,000	5,000	3,000	938	28	3,966	150	26.44	2.1	12.59	1	12.59
Tractor, HP =	55	10	20,500	6,355	1,415	1,007	29	2,450	500	4.90	2.1	2.33	0	0.00
+ Wagon		10	8,400	2,100	630	394	12	1,036	100	10.36	2.1	4.93	0	0.00
Tractor, HP =	55	10	20,500	6,355	1,415	1,007	29	2,450	500	4.90	2.1	2.33	0	0.00
+ Wagon		10	8,400	2,100	630	394	12	1,036	100	10.36	2.1	4.93	0	0.00
Pickup Truck, 3/4 Ton		10	25,600	6,656	1,894	1,210	36	3,140	500	6.28	10.0	0.63	4	2.51
Filling/Packing														
Tractor, HP=	55	10	20,500	6,355	1,415	1,007	29	2,450	500	4.90	1.4	3.50	1	3.50
+ Blower		10	0	0	0	0	0	0	100	0.00	1.4	0.00	0	0.00
										Crop Acres	Expense per Acre			
Silo		20	20,000	0	1,000	750	28	1,778	100	17.78				17.78
Machinery housing ^f		20	20,000	0	1,000	750	28	1,778	100	17.78				17.78
TOTAL													103.46	

^a Depreciation = (Initial cost - Salvage value) / years of life

^b Interest on investment = ((Initial cost + Salvage value) / 2) X interest rate

^c Combined rate of property taxes and insurance premiums as a percentage of the average investment

^d Per acre costs for self-propelled vehicles include an additional 10% allowance for travel time from farm to field

^e Total number of trips across the field per year for this operation

^f Show only the share of machinery housing and maintenance buildings attributed to corn silage machinery and equipment based on use.

Table 2. Operating expense for forage machinery and equipment per hour and per acre

Operation and Item	Repairs & Maint. ^a %	Repairs & Maint. ^a \$/Year	Repairs & Maint. ^b \$/Hour	Fuel Use Gals/hr	Cost per Gal \$	Fuel & Lube ^c \$/Hour	Equip. Op. Cost \$/Hour	Acres per Hour No.	Times Over No.	Oper. Cost ^d \$/Acre	Labor Cost \$/Hour	Labor Cost ^e \$/Acre	Total Expense \$/Acre
Fuel cost per gallon & Labor cost per hour =====>													
					4.00						9.40		
Tractor, HP=	55	2%	410	0.82	2.42	4.00	11.95	3.5	0	0.00	9.40	0.00	0.00
+ Chisel plow		3%	92	0.92	0		0.92	3.5	0	0.00			0.00
Tractor, HP=	35	2%	330	0.66	1.54	4.00	7.08	5.4	0	0.00	9.40	0.00	0.00
+ Disc		2%	81	0.81	0		0.81	5.4	0	0.00			0.00
Tractor, HP=	35	2%	330	0.66	1.54	4.00	7.08	5.4	0	0.00	9.40	0.00	0.00
+ Harrow		3%	41	0.41	0		0.41	5.4	0	0.00			0.00
Tractor, HP=	35	2%	394	0.79	1.54	4.00	7.08	11.1	1	0.78	9.40	0.97	1.75
+ Sprayer		3%	91	0.91	0		0.91	11.1	1	0.09			0.09
Tractor, HP=	75	2%	592	1.18	3.3	4.00	15.18	5.1	1	3.53	9.40	2.12	5.65
+ Planter/drill		1%	210	4.20	0		4.20	5.1	1	0.91			0.91
Tractor, HP=	35	2%	330	0.66	1.54	4.00	7.08	11.1	1	0.77	9.40	0.97	1.74
+ Sprayer		3%	111	1.11	0		1.11	11.1	1	0.11			0.11
Tractor, HP=	55	2%	410	0.82	2.42	4.00	11.13	1.0	0	0.00	9.40	0.00	0.00
+ Implement		2%	0	0.00	0		0.00	1.0	0	0.00			0.00
Pickup Truck, 3/4 Ton		2%	512	1.02	2.00	4.00	9.20	10.0	4	4.50	9.40	4.32	8.82
Self-propelled, HP=	450	1%	2,460	16.40	19.8	4.00	91.08	14.0	0	0.00	9.40	0.00	0.00
Tractor, HP=	75	2%	592	1.18	3.3	4.00	15.18	2.1	1	8.57	9.40	5.15	13.72
+ Pull Harvester		1%	320	3.20	0		3.20	2.1	1	1.68			1.68
Truck, used		4%	800	5.33	2.50	4.00	11.50	2.1	1	8.82	9.40	5.15	13.97
Tractor, HP =	55	2%	410	0.82	2.42	4.00	11.13	2.1	0	0.00	9.40	0.00	0.00
+ Wagon		2%	168	1.68	0		1.68	2.1	0	0.00			0.00
Tractor, HP =	55	2%	410	0.82	2.42	4.00	11.13	2.1	0	0.00	9.40	0.00	0.00
+ Wagon		2%	168	1.68	0		1.68	2.1	0	0.00			0.00
Pickup Truck, 3/4 Ton		2%	512	1.02	2.00	4.00	9.20	10.0	4	4.50	9.40	4.32	8.82
Tractor, HP=	55	2%	410	0.82	2.42	4.00	11.13	1.4	1	9.39	9.40	7.72	17.11
+ Blower		3%	0	0.00	0.00		0.00	1.4	0	0.00	9.40	0.00	0.00
Silo		1%	200							2.00			2.00
Machinery housing ^f		1%	200							2.00			2.00
TOTALS										56.45	35.88	92.33	

^a Repairs and maintenance costs are calculated as a % of the initial cost in Table 1. Percentages are higher for equipment bought used.

^b Repairs and maintenance costs per hour based on annual use shown in Table 1.

^c Total fuel cost plus lube costs estimated as 15% of the fuel cost.

^d Per acre costs for tractors and other self-propelled equipment includes an additional 10% allowance for travel time from farm to field.

^e Labor cost per acre includes an additional 15% allowance for travel time, setting up and finishing up.

^f Based on the machinery housing and maintenance buildings investment attributed to corn silage machinery and equipment in Table 1.

Table 3. Sensitivity Analysis

These tables show A) the total cost per ton of silage as made or sold, and B) per ton of dry matter produced, under various assumptions about costs and yields. Specifically, the cost and yields shown in the enterprise budget on the first page are believed to be fairly representative of conditions in North Carolina. However, there is a wide variation in conditions from one farm to another and costs and yields can vary from year to year. The table shows the effects of yields and costs that are 10 percent higher or lower than the basic budget, singly and in combination. The cost adjustments are "across the board" and, for example, do not reduce harvest costs if yields are reduced

A. TOTAL COST PER TON OF SILAGE AS MADE OR SOLD, AT THE MOISTURE CONTENT LISTED IN THE BUDGET

		YIELD		
		-10%	Base Budget	+10%
COST	-10%	\$45.26	\$40.74	\$37.03
	Base	\$50.29	\$45.26	\$41.15
	+10%	\$55.32	\$49.79	\$49.79

B. TOTAL COST PER TON OF DRY MATTER PRODUCED

		YIELD		
		-10%	Base Budget	+10%
COST	-10%	\$137.16	\$123.44	\$112.22
	Base	\$152.40	\$137.16	\$124.69
	+10%	\$167.64	\$150.87	\$150.87



NOTES, RESOURCES AND REFERENCES

Other NCSU enterprise budgets are available on the internet at http://www.ag-econ.ncsu.edu/extension/Ag_budgets.html or from your county extension office.

A searchable national enterprise budget library is available on-line at <http://www.agrisk.umn.edu/Budgets/>

"Estimating Farm Machinery Costs" Ag Decision Maker A3-29, Iowa State University, University Extension, April 2002