



2013

**North Carolina FFA Farm Business Management
Career Development Event**

Section II: Problem Solving (200 points) KEY

Read each problem carefully. The **main concept** of each problem is stated at the start of each problem. Read the entire problem before beginning work on that problem.

Section II contains six (6) problems. Check to see that you have 25 pages including the cover page. The point value for each of your answers is stated in parenthesis to the right of each blank or in the question text. You have 100 minutes to complete this section of the Career Development Event.

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2013 NC FFA Farm Business Management

Resource Information

Table 1. Statements of Net Worth

Resource Information for the Holbrook farm business, As of 12/31/2011 and 12/31/2012
2013 NC FFA Farm Business Management Career Development Event

	<u>12/31/11</u>	<u>12/31/12</u>
Assets		
<u>Current Assets</u>		
Cash in Farm Account	\$7,784	\$3,075
Farm Accounts Receivable	0	0
Stored Crops	1,200	3,500
Growing Crops	195,000	165,000
Other Current Assets	0	0
Total Current Assets	203,984	171,575
<u>Non Current Assets</u>		
Machinery & Buildings	70,800	65,970
Land (255 Acres)	624,750	637,500
Total Non-Current Assets	695,550	703,470
Total Farm Assets	\$899,534	\$875,045
Liabilities		
<u>Current Liabilities</u>		
Short Term Notes Payable	\$17,536	\$12,783
Accounts Payable	9,209	11,179
Portion of Machinery and Equipment Debt Due	7,047	6,342
Portion of Land Debt Due	22,275	20,048
Accrued Liabilities (taxes, rent)	0	2,000
Accrued Interest	0	0
Total Current Liabilities	56,067	52,352
<u>Non-Current Liabilities</u>		
Non-Current Liabilities Due after one year	72,123	65,781
Land Payment Due after One Year	267,975	247,928
Total Non-Current Liabilities	\$340,098	\$313,708
Total Farm Liabilities	\$396,165	\$366,060
Net Worth (Equity)	\$503,369	\$508,985

Table 2. Income Statements

Resource Information for the Holbrook farm business

2013 NC FFA Farm Business Management Career Development Event

	2011	2012
Revenue		
Blueberries	\$412,581	\$430,014
Wheat	17,935	18,692
Tomatoes	71,500	50,050
Tobacco	153,859	161,071
Strawberries	99,000	111,375
Farm Service Agency Payments	0	0
Total Revenue	\$754,875	\$771,203
Expenses		
Cash Operating Expenses		
Chemicals	\$170,220	\$184,214
Fertilizer & Lime	37,150	42,979
Freight/Trucking	13,293	13,898
Gas,Fuel,Oil	18,553	19,443
Insurance	69,601	78,336
Crop Insurance	12,358	17,805
Labor Hired	154,179	167,538
Machine Hire	2,901	3,744
Repairs-Mach	13,850	15,430
Repairs-Bldg	19,250	20,263
Seeds/Plants	39,134	26,198
Storage	3,545	3,705
Supplies	12,931	14,753
Taxes	21,559	26,140
Utilities-Farm Share	6,052	8,009
Miscellaneous Farm Expenses	10,742	10,026
Total Cash Operating Expenses	\$605,317	\$652,480
Inventory Adjustments		
Accounts Payable	14,656	17,875
Change in Accrued Taxes	2,750	2,450
Other Accrued Expenses	1,725	1,850
Depreciation	23,320	22,150
Total Operating Expenses	\$647,767	\$696,805
Cash Interest Paid	12,800	11,890
Change in Interest Payable	0	0
Total Interest Expense	\$12,800	\$11,890
Total Expenses	\$660,567	\$708,695
Net Farm Income From Operations	\$94,308	\$62,508

Table 3. Cash Flow Projection

ITEM	UNITS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
Operating Receipts														
WHEAT	120	0	12,630	12,630	0	0	0	0	0	0	0	0	0	25,260
BLUEBERRIES	40	0	0	0	0	360,000	150,000	150,000	0	0	0	0	0	660,000
TOBACCO	55	0	0	0	0	0	0	0	0	0	0	0	0	0
STRAWBERRIES	5	0	0	0	16,388	65,550	27,313	0	0	0	0	0	0	109,250
TOMATOES	25	0	0	0	0	0	214,500	214,500	0	0	0	0	0	429,000
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ACCTS RECEIVABLE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GOVT PAYMENTS	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Operating Receipts		0	12,630	12,630	16,388	425,550	391,813	364,500	0	0	0	0	0	1,223,510
Capital Sales														
Total Capital Sales		0	0	0	0	0	0	0	0	0	0	0	0	0
Non-Farm Income														
SPOUSE SALARY		3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	42,000
Total Cash Inflows		3,500	16,130	16,130	19,888	429,050	395,313	368,000	3,500	3,500	3,500	3,500	3,500	1,265,510
Operating Expenses														
SEED/PLANTS		3,520	4,188	4,188	0	0	0	0	0	0	0	0	0	11,895
FERTILIZER		0	1,790	4,100	1,951	1,133	2,139	0	0	968	0	0	0	12,081
LIME		0	0	410	0	0	0	0	0	773	0	0	0	1,183
HERBICIDE		0	0	13,626	0	332	0	0	0	0	0	0	0	13,958
INSECTICIDE		0	0	15,800	0	6,600	2,969	0	0	0	0	0	0	25,369
FUMIGATION/PLASTIC		0	0	1,100	0	0	1,500	0	0	7,000	0	0	0	9,600
SUCKER CONTROL		0	0	0	0	0	2,783	0	0	0	0	0	0	2,783
COVER CROP/RYE		0	0	0	0	0	0	0	0	747	0	0	0	747
FUNGICIDE		0	0	0	4,793	0	741	247	0	0	0	0	0	5,781
DRIP TAPE		0	0	0	0	0	0	0	0	1,740	0	0	0	1,740
CURING FUEL/BAILING		0	0	0	0	0	0	0	7,818	13,135	0	0	0	20,953
ELECTRICITY/CURING	600	600	600	600	600	600	600	600	1,891	2,537	600	600	600	10,428
MARKET ASSESSMENT		0	0	0	0	0	0	0	0	3,243	0	0	0	3,243
HARVEST/CARTONS		0	0	0	0	0	0	0	0	0	0	0	0	0
BEE HIVES		0	0	2,000	4,000	5,000	0	0	0	0	0	0	0	11,000
MACHINERY/MACH LABOR		0	0	0	2,364	2,364	2,364	0	0	400	0	0	0	7,492
PLASTIC DISPOSAL / ADVERT		0	0	1,267	1,267	1,267	0	0	3,800	0	0	0	0	7,601
FUEL, LUBE, REPAIRS	1,103	1,103	1,103	1,103	1,103	1,103	1,103	1,103	1,103	1,103	1,103	1,103	1,103	13,236
CASH RENT	2,000	0	43,240	0	0	0	0	0	0	0	0	0	0	45,240
LABOR HIRED	13,238	22,917	32,415	32,415	62,000	194,490	162,075	12,966	12,966	12,966	12,966	6,483	577,897	
MISCELLANEOUS COSTS	1,100	2,906	2,514	2,906	2,606	2,600	1,100	1,100	2,599	2,600	1,100	1,100	24,231	
CROP INSURANCE	0	0	0	0	0	0	0	0	6,210	0	0	0	0	6,210
TAXES (Real & Personal Property)	431	0	0	0	0	0	0	0	0	0	0	0	0	431
OTHER FARM OPER EXP	4,000	0	0	0	0	0	0	0	0	0	0	0	0	4,000
FARM INSURANCE	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	18,000
SLAUGHTERING	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LIVESTOCK (Purchased for Resale)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OVERHEAD EXPENSES	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Operating Expenses		27,492	35,004	123,863	52,899	84,505	212,789	166,625	30,178	54,921	18,769	17,269	10,786	835,099
Capital Purchases and other Expenses														
MACH AND EQUIP		0	0	0	0	0	0	0	0	120,000	80,000	0	0	200,000
BLDGS, FENCES, TILE		0	0	0	0	0	0	0	0	0	0	0	0	0
Payment on Debt														
PRINCIPAL		2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	28,800
INTEREST		2,700	2,700	2,700	2,700	2,700	2,700	2,700	2,700	2,700	2,700	2,700	2,700	32,400
Non-Farm Expenses														
FAMILY LIVING		4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	48,000
INCOME TAX, ETC.		0	0	28,070	0	0	0	0	0	0	0	0	0	28,070
SAVINGS		0	0	0	0	0	0	0	0	0	0	0	0	0
Total Other Expenses		9,100	9,100	37,170	9,100	9,100	9,100	9,100	9,100	9,100	129,100	89,100	9,100	337,270
Total Cash Outflows		36,592	44,104	161,033	61,999	93,605	221,889	175,725	39,278	64,021	147,869	106,369	19,886	1,172,369

Summary of Projected Cash Flow

CASH DIFFERENCE	-33,092	-27,974	-144,903	-42,112	335,445	173,424	192,275	-35,778	-60,521	-144,369	-102,869	-16,386	93,141	
Beginning Cash Balance	8,250	3,000	3,000	3,000	3,000	72,962	242,719	434,981	399,203	338,682	194,313	91,444		
CASH POSITION	-24,842	-24,974	-141,903	-39,112	338,445	246,385	434,994	399,203	338,682	194,313	91,444	75,058		
Money Borrowed this Period	27,842	27,974	144,903	42,112	0	0	0	0	0	0	0	0	242,830	
Operating Loan Information														
INTEREST PAYMENTS	0	0	0	0	1,675	1,991	13	13	0	0	0	0	3,679	
ACCRUED INTEREST	0	379	589	1,675	1,991	13	0	0	0	0	0	0	0	
PRINCIPAL PAYMENTS	0	0	0	0	263,808	1,675	0	0	0	0	0	0	265,484	
ACCUMULATED BORROWING	50,496	78,470	223,372	265,484	1,675	0	0	0	0	0	0	0	0	
ENDING CASH BALANCE	3,000	3,000	3,000	3,000	72,962	242,719	434,981	399,203	338,682	194,313	91,444	75,058	75,058	
BEGINNING BANK ACCOUNT BALANCE		8,250							75,058					
MINIMUM MONTHLY BANK BALANCE		3,000							0					
BEGINNING OPERATING LOAN AMOUNT		22,654							0					
BEGINNING ACCRUED INTEREST DUE		0												
INTEREST RATE ON OPERATING LOAN		9.00%							8.50				PER HOUR	

Table 4. Blueberries, Harvest & Market, 3rd Production Year

Resource Information for the Holbrook farm business, 31-Jan-13
 2012 NC FFA Farm Business Management Career Development Event

OPERATING INPUTS	UNITS	PRICE	QUANTITY	VALUE	YOUR VALUE
Pre-Harvest Costs					
Fertilizer	Cwt	51.000	3.15	160.65	_____
Herbicide	Per Acre	160.960	1	160.96	_____
Annual Operating Capital	Dollars	6.000%	5,706.000	342.36	_____
Plastic Mulch	Roll	75.000	3.5	262.50	_____
Drip Tape	Foot	0.020	8700	174.00	_____
Bee Hives	Per Each	35.000	2	70.00	_____
Fungicide	Per Acre	174.100	1	174.10	_____
Miticides	Gallon	19.750	4	79.00	_____
Insecticide	Gallon	20.600	1	20.60	_____
Machinery Fuel, Lube, Repairs	Dollars	1.000	38.230	38.23	_____
Field Labor	Hours	8.500	18.000	153.00	_____
Harvesting and Packing Costs					
Refrigeration costs	per day	1.800	30.00	54.00	_____
Marketing/Advertisement	Pounds	0.200	8,502.00	1,700.40	_____
Container	Per Each	0.150	8,502.00	1,275.30	_____
Harvest Labor	Hours	8.500	340.000	2,890.00	_____
TOTAL OPERATING COSTS				7,555.10	_____
FIXED COSTS		AMOUNT	VALUE	YOUR VALUE	
Machinery					
Interest at 7.150%		1.00	350.00	_____	
Depr, Taxes, Insurance		0.00	0.00	_____	
Irrigation					
Interest at 7.150%		0.00	0.00	_____	
Depr, Taxes, Insurance		0.00	0.00	_____	
Equipment					
Interest at 7.150%		0.00	0.00	_____	
Depr, Taxes, Insurance		0.00	0.00	_____	
Land					
Interest at 7.150%		1.00	750.00	_____	
Taxes		0.00	0.00	_____	
TOTAL FIXED COSTS				1,100.00	_____
PRODUCTION					
Blueberries - Before 20-May	Pounds	4.50	1,200.00	5,400.00	_____
Blueberries - After 20-May	Pounds	1.25	7,302.00	9,127.50	_____
Net Govt Payment	Per Acre	0.00	0.00	0.00	_____
TOTAL RECEIPTS				14,527.50	_____
TOTAL RECEIPTS				14,527.50	_____
TOTAL OPERATING COSTS				7,555.10	_____
RETURNS ABOVE TOTAL OPERATING COSTS				6,972.40	_____
TOTAL FIXED COSTS				1,100.00	_____
RETURNS ABOVE ALL SPECIFIED COSTS				5,872.40	_____

Break-Even (B-E) Analysis			
B-E Yield at \$/lb.	1.71	B-E Price at lbs/acre	8502.00
Above Operating Costs (Lbs.)	4421.51	Above Operating Costs \$	0.89
Above Total Costs (Lbs.)	5065.27	Above Total Costs \$	1.02

Table 5. Future Value (FV) of \$1 Investment

n/I	1.0%	1.5%	2.0%	2.5%	3.0%	3.5%	4.0%	4.5%	5.0%	5.5%	6.0%	7.0%	8.0%
1	1.01000	1.01500	1.02000	1.02500	1.03000	1.03500	1.04000	1.04500	1.05000	1.05500	1.06000	1.07000	1.08000
2	1.02010	1.03022	1.04040	1.05063	1.06090	1.07123	1.08160	1.09203	1.10250	1.11303	1.12360	1.14490	1.16640
3	1.03030	1.04568	1.06121	1.07689	1.09273	1.10872	1.12486	1.14117	1.15763	1.17424	1.19102	1.22504	1.25971
4	1.04060	1.06136	1.08243	1.10381	1.12551	1.14752	1.16986	1.19252	1.21551	1.23882	1.26248	1.31080	1.36049
5	1.05101	1.07728	1.10408	1.13141	1.15927	1.18769	1.21665	1.24618	1.27628	1.30696	1.33823	1.40255	1.46933
6	1.06152	1.09344	1.12616	1.15969	1.19405	1.22926	1.26532	1.30226	1.34010	1.37884	1.41852	1.50073	1.58687
7	1.07214	1.10984	1.14869	1.18869	1.22987	1.27228	1.31593	1.36086	1.40710	1.45468	1.50363	1.60578	1.71382
8	1.08286	1.12649	1.17166	1.21840	1.26677	1.31681	1.36857	1.42210	1.47746	1.53469	1.59385	1.71819	1.85093
9	1.09369	1.14339	1.19509	1.24886	1.30477	1.36290	1.42331	1.48610	1.55133	1.61909	1.68948	1.83846	1.99900
10	1.10462	1.16054	1.21899	1.28008	1.34392	1.41060	1.48024	1.55297	1.62889	1.70814	1.79085	1.96715	2.15892
11	1.11567	1.17795	1.24337	1.31209	1.38423	1.45997	1.53945	1.62285	1.71034	1.80209	1.89830	2.10485	2.33164
12	1.12683	1.19562	1.26824	1.34489	1.42576	1.51107	1.60103	1.69588	1.79586	1.90121	2.01220	2.25219	2.51817
13	1.13809	1.21355	1.29361	1.37851	1.46853	1.56396	1.66507	1.77220	1.88565	2.00577	2.13293	2.40985	2.71962
14	1.14947	1.23176	1.31948	1.41297	1.51259	1.61869	1.73168	1.85194	1.97993	2.11609	2.26090	2.57853	2.93719
15	1.16097	1.25023	1.34587	1.44830	1.55797	1.67535	1.80094	1.93528	2.07893	2.23248	2.39656	2.75903	3.17217
16	1.17258	1.26899	1.37279	1.48451	1.60471	1.73399	1.87298	2.02237	2.18287	2.35526	2.54035	2.95216	3.42594
17	1.18430	1.28802	1.40024	1.52162	1.65285	1.79468	1.94790	2.11338	2.29202	2.48480	2.69277	3.15882	3.70002
18	1.19615	1.30734	1.42825	1.55966	1.70243	1.85749	2.02582	2.20848	2.40662	2.62147	2.85434	3.37993	3.99602
19	1.20811	1.32695	1.45681	1.59865	1.75351	1.92250	2.10685	2.30786	2.52695	2.76565	3.02560	3.61653	4.31570
20	1.22019	1.34686	1.48595	1.63862	1.80611	1.98979	2.19112	2.41171	2.65330	2.91776	3.20714	3.86968	4.66096
21	1.23239	1.36706	1.51567	1.67958	1.86029	2.05943	2.27877	2.52024	2.78596	3.07823	3.39956	4.14056	5.03383
25	1.28243	1.45095	1.64061	1.85394	2.09378	2.36324	2.66584	3.00543	3.38635	3.81339	4.29187	5.42743	6.84848
30	1.34785	1.56308	1.81136	2.09757	2.42726	2.80679	3.24340	3.74532	4.32194	4.98395	5.74349	7.61226	10.06266
40	1.48886	1.81402	2.20804	2.68506	3.26204	3.95926	4.80102	5.81636	7.03999	8.51331	10.28572	14.97446	21.72452

Table 6. Future Value (FV) of \$1 Annuity

n/i	1.0%	1.5%	2.0%	2.5%	3.0%	3.5%	4.0%	4.5%	5.0%	5.5%	6.0%	7.0%	8.0%
1	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
2	2.0100	2.0150	2.0200	2.0250	2.0300	2.0350	2.0400	2.0450	2.0500	2.0550	2.0600	2.0700	2.0800
3	3.0301	3.0452	3.0604	3.0756	3.0909	3.1062	3.1216	3.1370	3.1525	3.1680	3.1836	3.2149	3.2464
4	4.0604	4.0909	4.1216	4.1525	4.1836	4.2149	4.2465	4.2782	4.3101	4.3423	4.3746	4.4399	4.5061
5	5.1010	5.1523	5.2040	5.2563	5.3091	5.3625	5.4163	5.4707	5.5256	5.5811	5.6371	5.7507	5.8666
6	6.1520	6.2296	6.3081	6.3877	6.4684	6.5502	6.6330	6.7169	6.8019	6.8881	6.9753	7.1533	7.3359
7	7.2135	7.3230	7.4343	7.5474	7.6625	7.7794	7.8983	8.0192	8.1420	8.2669	8.3938	8.6540	8.9228
8	8.2857	8.4328	8.5830	8.7361	8.8923	9.0517	9.2142	9.3800	9.5491	9.7216	9.8975	10.2598	10.6366
9	9.3685	9.5593	9.7546	9.9545	10.1591	10.3685	10.5828	10.8021	11.0266	11.2563	11.4913	11.9780	12.4876
10	10.4622	10.7027	10.9497	11.2034	11.4639	11.7314	12.0061	12.2882	12.5779	12.8754	13.1808	13.8164	14.4866
11	11.5668	11.8633	12.1687	12.4835	12.8078	13.1420	13.4864	13.8412	14.2068	14.5835	14.9716	15.7836	16.6455
12	12.6825	13.0412	13.4121	13.7956	14.1920	14.6020	15.0258	15.4640	15.9171	16.3856	16.8699	17.8885	18.9771
13	13.8093	14.2368	14.6803	15.1404	15.6178	16.1130	16.6268	17.1599	17.7130	18.2868	18.8821	20.1406	21.4953
14	14.9474	15.4504	15.9739	16.5190	17.0863	17.6770	18.2919	18.9321	19.5986	20.2926	21.0151	22.5505	24.2149
15	16.0969	16.6821	17.2934	17.9319	18.5989	19.2957	20.0236	20.7841	21.5786	22.4087	23.2760	25.1290	27.1521
16	17.2579	17.9324	18.6393	19.3802	20.1569	20.9710	21.8245	22.7193	23.6575	24.6411	25.6725	27.8881	30.3243
17	18.4304	19.2014	20.0121	20.8647	21.7616	22.7050	23.6975	24.7417	25.8404	26.9964	28.2129	30.8402	33.7502
18	19.6147	20.4894	21.4123	22.3863	23.4144	24.4997	25.6454	26.8551	28.1324	29.4812	30.9057	33.9990	37.4502
19	20.8109	21.7967	22.8406	23.9460	25.1169	26.3572	27.6712	29.0636	30.5390	32.1027	33.7600	37.3790	41.4463
20	22.0190	23.1237	24.2974	25.5447	26.8704	28.2797	29.7781	31.3714	33.0660	34.8683	36.7856	40.9955	45.7620
21	23.2392	24.4705	25.7833	27.1833	28.6765	30.2695	31.9692	33.7831	35.7193	37.7861	39.9927	44.8652	50.4229
30	34.7849	37.5387	40.5681	43.9027	47.5754	51.6227	56.0849	61.0071	66.4388	72.4355	79.0582	94.4608	113.2832
40	48.8864	54.2679	60.4020	67.4026	75.4013	84.5503	95.0255	107.0303	120.7998	136.6056	154.7620	199.6351	259.0565

Table 7. Present Value (PV) of \$1 Lump Sum

n/i	1.0%	1.5%	2.0%	2.5%	3.0%	3.5%	4.0%	4.5%	5.0%	5.5%	6.0%	7.0%	8.0%
1	0.99010	0.98522	0.98039	0.97561	0.97087	0.96618	0.96154	0.95694	0.95238	0.94787	0.94340	0.93458	0.92593
2	0.98030	0.97066	0.96117	0.95181	0.94260	0.93351	0.92456	0.91573	0.90703	0.89845	0.89000	0.87344	0.85734
3	0.97059	0.95632	0.94232	0.92860	0.91514	0.90194	0.88900	0.87630	0.86384	0.85161	0.83962	0.81630	0.79383
4	0.96098	0.94218	0.92385	0.90595	0.88849	0.87144	0.85480	0.83856	0.82270	0.80722	0.79209	0.76290	0.73503
5	0.95147	0.92826	0.90573	0.88385	0.86261	0.84197	0.82193	0.80245	0.78353	0.76513	0.74726	0.71299	0.68058
6	0.94205	0.91454	0.88797	0.86230	0.83748	0.81350	0.79031	0.76790	0.74622	0.72525	0.70496	0.66634	0.63017
7	0.93272	0.90103	0.87056	0.84127	0.81309	0.78599	0.75992	0.73483	0.71068	0.68744	0.66506	0.62275	0.58349
8	0.92348	0.88771	0.85349	0.82075	0.78941	0.75941	0.73069	0.70319	0.67684	0.65160	0.62741	0.58201	0.54027
9	0.91434	0.87459	0.83676	0.80073	0.76642	0.73373	0.70259	0.67290	0.64461	0.61763	0.59190	0.54393	0.50025
10	0.90529	0.86167	0.82035	0.78120	0.74409	0.70892	0.67556	0.64393	0.61391	0.58543	0.55839	0.50835	0.46319
11	0.89632	0.84893	0.80426	0.76214	0.72242	0.68495	0.64958	0.61620	0.58468	0.55491	0.52679	0.47509	0.42888
12	0.88745	0.83639	0.78849	0.74356	0.70138	0.66178	0.62460	0.58966	0.55684	0.52598	0.49697	0.44401	0.39711
13	0.87866	0.82403	0.77303	0.72542	0.68095	0.63940	0.60057	0.56427	0.53032	0.49856	0.46884	0.41496	0.36770
14	0.86996	0.81185	0.75788	0.70773	0.66112	0.61778	0.57748	0.53997	0.50507	0.47257	0.44230	0.38782	0.34046
15	0.86135	0.79985	0.74301	0.69047	0.64186	0.59689	0.55526	0.51672	0.48102	0.44793	0.41727	0.36245	0.31524
16	0.85282	0.78803	0.72845	0.67362	0.62317	0.57671	0.53391	0.49447	0.45811	0.42458	0.39365	0.33873	0.29189
17	0.84438	0.77639	0.71416	0.65720	0.60502	0.55720	0.51337	0.47318	0.43630	0.40245	0.37136	0.31657	0.27027
18	0.83602	0.76491	0.70016	0.64117	0.58739	0.53836	0.49363	0.45280	0.41552	0.38147	0.35034	0.29586	0.25025
19	0.82774	0.75361	0.68643	0.62553	0.57029	0.52016	0.47464	0.43330	0.39573	0.36158	0.33051	0.27651	0.23171
20	0.81954	0.74247	0.67297	0.61027	0.55368	0.50257	0.45639	0.41464	0.37689	0.34273	0.31180	0.25842	0.21455
21	0.81143	0.73150	0.65978	0.59539	0.53755	0.48557	0.43883	0.39679	0.35894	0.32486	0.29416	0.24151	0.19866
24	0.78757	0.69954	0.62172	0.55288	0.49193	0.43796	0.39012	0.34770	0.31007	0.27666	0.24698	0.19715	0.15770
25	0.77977	0.68921	0.60953	0.53939	0.47761	0.42315	0.37512	0.33273	0.29530	0.26223	0.23300	0.18425	0.14602
28	0.75684	0.65910	0.57437	0.50088	0.43708	0.38165	0.33348	0.29157	0.25509	0.22332	0.19563	0.15040	0.11591
29	0.74934	0.64936	0.56311	0.48866	0.42435	0.36875	0.32065	0.27902	0.24295	0.21168	0.18456	0.14056	0.10733
30	0.74192	0.63976	0.55207	0.47674	0.41199	0.35628	0.30832	0.26700	0.23138	0.20064	0.17411	0.13137	0.09938
31	0.73458	0.63031	0.54125	0.46511	0.39999	0.34423	0.29646	0.25550	0.22036	0.19018	0.16425	0.12277	0.09202
40	0.67165	0.55126	0.45289	0.37243	0.30656	0.25257	0.20829	0.17193	0.14205	0.11746	0.09722	0.06678	0.04603

Table 8. Present Value (PV) of \$1 Annuity

n/i	1.0%	1.5%	2.0%	2.5%	3.0%	3.5%	4.0%	4.5%	5.0%	5.5%	6.0%	7.0%	8.0%
1	0.99010	0.98522	0.98039	0.97561	0.97087	0.96618	0.96154	0.95694	0.95238	0.94787	0.94340	0.93458	0.92593
2	1.97040	1.95588	1.94156	1.92742	1.91347	1.89969	1.88609	1.87267	1.85941	1.84632	1.83339	1.80802	1.78326
3	2.94099	2.91220	2.88388	2.85602	2.82861	2.80164	2.77509	2.74896	2.72325	2.69793	2.67301	2.62432	2.57710
4	3.90197	3.85438	3.80773	3.76197	3.71710	3.67308	3.62990	3.58753	3.54595	3.50515	3.46511	3.38721	3.31213
5	4.85343	4.78264	4.71346	4.64583	4.57971	4.51505	4.45182	4.38998	4.32948	4.27028	4.21236	4.10020	3.99271
6	5.79548	5.69719	5.60143	5.50813	5.41719	5.32855	5.24214	5.15787	5.07569	4.99553	4.91732	4.76654	4.62288
7	6.72819	6.59821	6.47199	6.34939	6.23028	6.11454	6.00205	5.89270	5.78637	5.68297	5.58238	5.38929	5.20637
8	7.65168	7.48593	7.32548	7.17014	7.01969	6.87396	6.73274	6.59589	6.46321	6.33457	6.20979	5.97130	5.74664
9	8.56602	8.36052	8.16224	7.97087	7.78611	7.60769	7.43533	7.26879	7.10782	6.95220	6.80169	6.51523	6.24689
10	9.47130	9.22218	8.98259	8.75206	8.53020	8.31661	8.11090	7.91272	7.72173	7.53763	7.36009	7.02358	6.71008
11	10.36763	10.07112	9.78685	9.51421	9.25262	9.00155	8.76048	8.52892	8.30641	8.09254	7.88687	7.49867	7.13896
12	11.25508	10.90751	10.57534	10.25776	9.95400	9.66333	9.38507	9.11858	8.86325	8.61852	8.38384	7.94269	7.53608
13	12.13374	11.73153	11.34837	10.98319	10.63496	10.30274	9.98565	9.68285	9.39357	9.11708	8.85268	8.35765	7.90378
14	13.00370	12.54338	12.10625	11.69091	11.29607	10.92052	10.56312	10.22283	9.89864	9.58965	9.29498	8.74547	8.24424
15	13.86505	13.34323	12.84926	12.38138	11.93794	11.51741	11.11839	10.73955	10.37966	10.03758	9.71225	9.10791	8.55948
16	14.71787	14.13126	13.57771	13.05500	12.56110	12.09412	11.65230	11.23402	10.83777	10.46216	10.10590	9.44665	8.85137
17	15.56225	14.90765	14.29187	13.71220	13.16612	12.65132	12.16567	11.70719	11.27407	10.86461	10.47726	9.76322	9.12164
18	16.39827	15.67256	14.99203	14.35336	13.75351	13.18968	12.65930	12.15999	11.68959	11.24607	10.82760	10.05909	9.37189
19	17.22601	16.42617	15.67846	14.97889	14.32380	13.70984	13.13394	12.59329	12.08532	11.60765	11.15812	10.33560	9.60360
20	18.04555	17.16864	16.35143	15.58916	14.87747	14.21240	13.59033	13.00794	12.46221	11.95038	11.46992	10.59401	9.81815
21	18.85698	17.90014	17.01121	16.18455	15.41502	14.69797	14.02916	13.40472	12.82115	12.27524	11.76408	10.83553	10.01680
25	22.02316	20.71961	19.52346	18.42438	17.41315	16.48151	15.62208	14.82821	14.09394	13.41393	12.78336	11.65358	10.67478
30	25.80771	24.01584	22.39646	20.93029	19.60044	18.39205	17.29203	16.28889	15.37245	14.53375	13.76483	12.40904	11.25778
40	32.83469	29.91585	27.35548	25.10278	23.11477	21.35507	19.79277	18.40158	17.15909	16.04612	15.04630	13.33171	11.92461

2013 NC FFA Farm Business Management

Problem Solving Section

Common Ratios and Financial Indicators	Formula
Current Ratio	$\text{Current Assets} \div \text{Current Liabilities}$
Working Capital	$\text{Current Assets} - \text{Current Liabilities}$
Debt-to-Equity	$\text{Total Liabilities} \div \text{Net Worth}$
Debt-to-Asset	$\text{Total Liabilities} \div \text{Total Assets}$
Rate of Return on Assets (ROA)	$(\text{Net Farm Income} + \text{Interest Expense} - \text{Unpaid Labor}) \div [\text{Average Value of Assets}]$
Rate of Return on Equity (ROE)	$(\text{Net Farm Income} - \text{Unpaid Labor}) / [\text{Average Value of Equity}]$
Asset Turnover Ratio	$\text{Total Revenue} / [\text{Average Value of Assets}]$
Return to Management	$\text{Net Farm Income} - \text{Unpaid labor} - \text{opportunity cost of farm equity}$
Net Farm Income from Operations Ratio	$\text{Net Farm Income} / \text{Gross revenue}$

Part 1 – Analysis of Cash Flow

30 points

In the Resource Information, you will find the cash flow projection for the Holbrook Farm in 2013. (Round percentages to tenth of a percent, e.g. XX.X%)

1. Each month the farm needs to calculate whether there is a cash surplus or a cash deficit based on the income and expense for the month, and the cash balance at the beginning of the month. If there is a deficit, money will need to be borrowed by the operation. Each question is 1 point.

- a. Which 3 months of the year generates the largest amount of cash for the farm?

May, June, July

- b. Which month has the largest end-of-month cash position for the farm?

July

- c. Which month has the largest negative cash difference for the farm?

March

- d. Which month has the smallest end-of-month cash position?

March

- e. How many months have a positive cash difference?

3

- f. As of July 1, what was the gain or loss in cash position from the January 31 balance?

\$271,226 $246,385 - (-24,842) = \$271,226$

- g. What is the total gain or loss in cash position from the January 1 balance to December 31?

\$99,900 $75,058 - (-24,842) = \$99,990$

2. What are the two largest outflow categories in this cash flow? (1 point each response)

- a. Labor Hired
- b. Machinery & Equipment

3. There is value in making comparisons between the percentages of certain categories in the cash flow. An individual producer may compare totals or individual sections of the cash flow. These percentages can then be compared to those of other producers. Consider each 3 month block as a quarter. For example, Quarter 1 consists of January, February, and March. Using this information, answer the following questions. **2 points each blank.**

a. What percent of the total farm outflows are the outflows in the final quarter of the year?

23.4% $(\$147,869 + \$106,369 + \$19,886) / \$1,172,369$

b. What percent of the total farm inflows are the inflows in the final quarter of the year?

0.8% $(\$3,500 + \$3,500 + \$3,500) / \$1,265,510 = 0.8297\%$

c. What percent of total inflows are the total outflows?

92.6% $\$1,172,369 / \$1,265,510 = 92.64\%$

d. What percent of total inflows is the ending cash balance?

5.9% $\$75,058 / \$1,265,510 = 5.931\%$

4. Did the debt increase or decrease during the year? **Circle the correct response. 2 points.**

INCREASE

DECREASE

5. Name two categories in the cash flow that have the same dollar amount listed for each month? **1 point each blank.**

Fuel, Lube, Repairs Farm Insurance
(also accepted: Payment on debt (Interest and Principal), Spousal Salary, Family Living)

6. What was the maximum amount of operating loan debt projected against the Holbrook Farm Business for 2013? **2 points.**

265,484

7. What percentage of total inflows is the non- farm income? **2 points.**

3.3% $\$42,000 / 1,265,510 = 3.319\%$

8. What percent of total outflows are non-farm expenses? **2 points.**

6.5% $(\$48,000 + \$28,070) / 1,172,369 = 6.489\%$

9. If Mr. Holbrook had opted not to purchase the tractor (\$120,000) and the customized pickup (\$80,000) in this cash flow plan, what would the totals below be for the year? **1 point each.**

a. Total Inflows: \$1,265,510 no change

b. Total Outflows: \$972,369 $\$1,172,369 - \$200,000 = \$972,369$

c. Ending Cash Balance: \$275,058 $\$200,000 + \$75,058 = \$275,058$

Part 2 – Analysis of Balance Sheets

44 points

Questions 1 through 11 refer to Holbrook Farm Business **Table 1. Statements of Net Worth** on **page 4**. For multiple choice questions, circle the correct response. For all other questions, write your answer in the blank.

Round ratios to two decimals. Each question is 4 points.

1. What was Holbrook Farm Business' Current Ratio on **December 31, 2011**?

3.6 (203,985 / 56,067)

2. What was Holbrook Farm Business' Current Ratio on **December 31, 2012**?

3.3 (171,575 / 52,352)

3. How much working capital did the Holbrook Farm Business have on **December 31, 2012**?

119,223 (171,575 - 52,352)

4. Which measure shows the size or magnitude of the ratio of total liabilities to total assets?

- a) Equity-to-asset ratio
- b) Net worth
- c) **Debt-to-asset ratio ****
- d) All of the above
- e) None of the above

5. Consider the change in **liquidity** on Holbrook Farm Business between December 31, 2011 and December 31, 2012. Based on the balance sheet information, was the farm business:

- a) **More liquid on December 31, 2011**
- b) More liquid on December 31, 2012
- c) Less liquid on December 31, 2011
- d) Both B and C
- e) None of the above

6. What was the Holbrook Farm Business **Debt-to-Equity Ratio** on **December 31, 2011**?

0.787 or 0.8 (396,165 / 503,369)

7. What **percent** of the Holbrook Farm Business **assets were financed by debt** on **December 31, 2011**?

44.0% or 44.0 (396,165 / 899,534 *100%)

8. Consider the change in solvency on Holbrook Farm Business between December 31, 2011 and December 31, 2012. Based on the balance sheet information, was the farm business:

- a) More solvent on December 31, 2011
- b) More solvent on December 31, 2012
- c) Less solvent on December 31, 2012
- d) **Both A and C**
- e) None of the above

9. What was Holbrook Farm Business **Debt-to-Equity Ratio** on **December 31, 2012**?

0.30 or 0.301 (366,060 / 508,985)

10. What **percent** of Holbrook Farm Business **assets were financed by equity** on **December 31, 2012**?

58.2% (875,045 / 508,985)*100%

11. Assume the liability values are accurate and the asset values shown on the balance sheet accurately represent the values of the assets if the assets had been sold on the dates specified. If on **December 31, 2012**, Holbrook Farm Business had **sold all assets** and **paid off all debts**, how much money would the business have had left?

508,985 (define: equity)

Part 3 – Analysis of Income Statements

20 points

Questions 1 through 6 refer to Holbrook Farm Business **Table 1. Statements of Net Worth on page 4** and **Table 2. Income Statements on page 5**. Round your answers to two decimals. Each question is worth 4 points.

Important Notes:

- **Opportunity Cost of Farm Equity is 3.5%**
- **Value of Unpaid Labor is \$35,000**

1. What is the **rate of return on assets in 2012?**

_____ 4.44 %

$(\text{NFI} + \text{Interest} - \text{Unpaid Labor}) / [(\text{Average Value of Assets})]$

2. What is the **rate of return on equity in 2012?**

_____ 5.43 %

$(\text{NFI} - \text{Unpaid Labor}) / [(\text{Average Value of Equity})]$

3. What is the **asset turnover ratio in 2012?**

_____ 0.87 or 87% or 86.9%

$(\text{Gross Revenue}) / [(\text{Average Value of Assets})]$

4. What is the **return to management in 2012?**

\$ _____ 9,791.45

$(\text{NFI} - \text{Unpaid labor} - \text{opportunity cost of farm equity})$

5. What is the **net farm income from operations ratio in 2012?**

_____ 0.081 or 8.1%

$(\text{NFI} / \text{Gross revenue})$

Part 4 – Partial Budgeting

27 points

Proposed Change: Switch from raising corn silage to wheat.

The Holbrooks have been raising corn silage to sell to a neighboring cattle operation. The Holbrooks were wondering if they should raise more wheat since they are able to contract it for \$10.00/cwt or \$200/ton. The Holbrooks can sell their corn silage for \$30/ton in the field. Their yields have been around 30 tons per acre. They estimate their expenses (variable and fixed) to be about \$565 per acre for corn silage.

Historically, the Holbrook's average wheat yield has been 110 bushels per acre. A bushel of wheat weighs 60 lbs, so this would be 6,600 lbs of wheat per acre. The Holbrooks figure their total cost of wheat production to be about \$600 per acre. **Calculate your answers on a per acre basis.**

Use the Partial Budget below to determine if the Holbrooks should switch from corn silage to wheat. Table values are 2 points each. Completion answers are 1 point.

Using the form below, construct a partial budget to determine the **expected change in net returns per acre** from the given proposal. **Note: Write "none" or "zero" in any category with no entry. Round answers to two decimal places.** (3 points each blank)

<u>Added Returns</u> 110 bu/acre X \$6/bu = \$ 660 OR 66 X \$ 10.00 = \$ 660	<u>Reduced Returns</u> \$30/ton * 30 tons/acre
Subtotal \$ <u>660</u>	Subtotal \$ <u>900</u>
<u>Reduced Costs</u>	<u>Added Costs</u>
\$565	\$ 600 (producing wheat)
Subtotal \$ <u>565</u>	Subtotal \$ <u>600</u>
Total AR+RC \$ <u>1,225</u>	Total RR+AC \$ <u>1,500</u>
Net Change \$ <u>(275) or -275</u>	

1. Should the Holbrooks raise wheat instead of corn silage? (2 points) **Circle the correct response.**

YES

NO

2. At what price for wheat would the Holbrook farm business find the partial budget difference to be zero? (4 points) **Round to TWO decimal places.**

\$ 14.17 per CWT

$(\$1,500 - 565)/66 = 14.17$ per CWT OR
 $(\$1,500 - 565)/110 = 8.5$ (per bushel) OR
 $(\$1,500 - 565)/30 = 31.17$ (per ton)

Part 5 – Time Value of Money

38 points

The Holbrook Farm wants to buy a used 2008 Dodge Sprinter van to haul blueberries and strawberries to market rather than hire a contractor to do this for them. They plan to purchase the van under a combination of a trade-in (their old pickup) and loan. The dealer will give them \$4,000 trade-in and the price of the Dodge is \$28,000. The banker will give them a loan for five years with an interest rate of 6.00%. The payments are due in six annual payments. The pickup is paid for and has no loan balance. Complete the last row of the repayment schedule below. Then answer the questions that follow. Round your answers to the nearest cent. **(2 points each in the table)**

Payment	Annual Payment Amount	Interest Amount	Principal Amount	Balance
0				\$24,000.00
1	\$5,697.51	\$1,440.00	\$4,257.51	\$19,742.49
2	\$5,697.51	\$1,184.55	\$4,512.96	\$15,229.52
3	\$5,697.51	\$913.77	\$4,783.74	\$10,445.78
4	\$5,697.51	\$626.75	\$5,070.77	\$5,375.01
5	\$5,697.51	\$322.50	\$5,375.01	\$0.00

1. What is the accumulated interest?

4,487.57 (2)

2. What is the cost for each \$100 you borrow?

\$44.88 (2)

3. When Mr. Holbrook shops for a loan, he should shop for which of the following? 2 points

- a. Interest Rate
- b. Repayment Term
- c. APR
- d. a and b
- e. **b and c**

James is considering an alternative repayment method for the pickup loan. With this repayment method, the same principal payment is made each year. To arrive at the total payment for the year, interest on the outstanding balance is added to the constant principal payment. The price of the Dodge Sprinter and the trade-in value of the pickup is the same as in the previous problem, \$28,000 and \$4,000, respectively. The loan interest rate remains at 6.00% and the repayment period stays at five years. Annual payments are made on the loan. For the repayment schedule below, use this information to complete the last row of the repayment schedule below and then answer the questions that follow. Round your answers to the nearest cent. **(2 points each in the table)**

Payment	Annual Payment Amount	Interest Amount	Principal Amount	Balance
0				\$24,000.00
1	\$6,240.00	\$1,440.00	\$4,800.00	\$19,200.00
2	\$5,952.00	\$1,152.00	\$4,800.00	\$14,400.00
3	\$5,664.00	\$864.00	\$4,800.00	\$9,600.00
4	\$5,376.00	\$576.00	\$4,800.00	\$4,800.00
5	\$5,088.00	\$288.00	\$4,800.00	\$0.00

4. What is the accumulated interest?

 \$4,320.00 (2)

5. What is the cost for each \$100 borrowed?

 \$43.20 (2)

6. Why is the accumulated interest payment using this repayment method smaller than an amortized loan (the previous loan)?
- The initial size of the loan is smaller.
 - Principal payments are larger in the early repayment periods.**
 - The total payments are larger.
7. The time value of money is the concept of computing the value of money, either in the present or future, based on a given
- interest rate.
 - length of time.
 - inflation rate.
 - a and b**
 - b and c
8. Compounding is the process of determining which of the following?
- Future value of a current sum of money.**
 - Present value of a future sum of money.
 - Annual loan payment amount.
9. Mr. Holbrook is considering retiring in 10 years and wants to increase the amount of money that he has in his retirement account. He is planning on making a contribution of \$10,000 at the end of each year for the next 10 years. The interest rate on the account is 3.5%. Use this information and the Resource Information provided to answer the following questions.
- What will be the value of the retirement account at the end of 10 years?

$$\underline{\$117,314} \qquad \$10,000 * 11.7314 = \$117,314$$
 - If the account could achieve a 7% rate of return, the value of the account at the end of 10 years will be \$138,164. How many times larger is the account in 10 years with a 7% rate of return compared to the account with a 3.5% rate of return?

$$\underline{1.18} \text{ times} \qquad \$138,164 / \$117,314 = 1.18$$
10. What is the internal rate of return?
- An investment analysis method that estimates time required for the cash inflows from the investment to return the initial investment outlay.
 - An investment analysis method that weighs the present value of cash inflows against the present value of cash outflows.
 - An investment analysis method that determines the rate of return that equates the present value of cash inflows to the present value of cash outflows.**

Part 6 - Enterprise Analysis

41 points

North Carolina's southern highbush cultivars are arguably the most flavorful blueberries in North America. Most North Carolina blueberries grown for commercial shipping are harvested between early June and late July. During the last decade, fresh berries shipped from North Carolina before May 20 averaged close to \$4.50 per pound. After May 20, when large volumes of fresh berries enter the market from other areas of the country, the average price drops dramatically. After June 1, fresh blueberries packed in 1-pint (or 1 pound) containers and shipped to national markets only return to the grower on average \$1.25 per pound.

The budget is for established blueberries bushes that are 5 years old and in their third production year. The budget assumes that 1,740 plants were set per acre in year one and that 1,417 of those plants remain in year 5. The remaining bushes are assumed to produce 6 pounds of blueberries per plant. A flat of blueberries weighs 3.7 lbs. **Each question is worth 4 points unless otherwise noted.**

Refer to the Blueberries enterprise budget on **page 7** (Table 4. Blueberries, Harvest & Market, 3rd Production Year).

1. According to the budget is it more expensive to grow the blueberries or harvest the blueberries?
Circle the correct response.

GROW

HARVEST

2. What is the total cost of growing 40 acres of blueberries if the yield per acre is 8,502 lbs.?

$$\frac{346,204}{40 \text{ acres} * \$8,655.10 \text{ total costs per acre} = \$346,204}$$

3. Blueberries are selling for \$15 per flat. Given that current yields are 8,502 lbs. per acre, what is the net return above operating costs on 40 acres of blueberries?

$$\frac{278,896}{40 \text{ acres} * \$6,972.40 \text{ net returns per acre above operating costs} = \$278,896}$$

4. What will be the total cost of insecticide and miticides for a 40 acre blueberry farm?

$$\frac{3,984}{40 \text{ acres} * (79 + 20.60) = \$3,984}$$

5. How many blueberry plants were originally planted on the 40 acre operation?

$$\frac{69,600}{40 \text{ acres} * 1,740 \text{ plants per acre} = 69,600 \text{ plants}}$$

6. The increasing price of oil is also raising fertilizer prices. What is the cost per acre for fertilizer if the new price is \$0.60 per pound?

$$\frac{\$189}{\$0.60 * 315 \text{ lbs} = \$189}$$

7. Production for 2013 is expected to be 2,117 flats per acre because of a late frost. What will be the total cost to package 40 acres of blueberries using the revised output per acre?

$$\frac{\$46,997.40}{\$0.15 \text{ per container} * 3.7 \text{ containers per flat} * 2,117 \text{ flats per acre} * 40 \text{ acres} = \$46,997.40}$$

8. The University of California Extension system has provided the data in the table below on growing strawberries on one acre of land. What would be the difference in profit of producing 40 acres of blueberries versus 40 acres of strawberries? **Each blank is worth 3 points.**

Item	Quantity or Amount
Total Production	5,429 trays
Average selling price (fresh)	\$7.25/tray
Cultural Costs	\$8,446
Harvest Costs	\$21,019
Marketing Costs	\$2,953

Strawberries, Total Annual Returns (Revenue LESS Costs): \$ 277,690 (3)

Blueberries, Total Annual Returns (Revenue LESS Costs): \$ 234,896 (3)

Difference: \$ 42,794 (3)

Which enterprise results in a higher total annual return? Circle the correct response.

BLUEBERRIES

STRAWBERRIES

9. Strawberries are known to fluctuate between \$5.25 and \$9.75 per tray. Under what price for strawberries would you decide to plant blueberries instead of strawberries? Use the same output and costs as question 8.

$$\frac{\$7.06 \text{ or } \$7.05}{[\$5,872.4 + (\$8,446 + \$21,019 + \$2,953)]/5429 \text{ trays} = \$7.05/\text{tray}}$$

End of the 2013 NC FFA Farm Business Management Exam

Score Sheet

Name: _____

Chapter: _____

2013 NC FFA			
Farm Business Management: Problem Solving			
		Possible Points	Contestant's Points
Part 1	Analysis of Cash Flow	30	
Part 2	Analysis of Balance Sheets	44	
Part 3	Analysis of Income Statements	20	
Part 4	Partial Budgeting	27	
Part 5	Time Value of Money	38	
Part 6	Enterprise Analysis	41	
		200	