



Sugarbeet Grower Workbook

Each club member is required to keep a businesslike record of the projects carried out each year. It is **good business** to keep **complete** and **accurate** records. The purpose of this record book is to let you know how you stand in dollars and cents after completing the year's work. It is an important part of your club project, as it will help others know what you have done in your club work and how well you have succeeded. Be sure to take good care of it and keep it up-to-date.

Keep your record book current. As soon as an activity is completed, such as selecting land, fertilizer, or other materials, enters it in the proper space in your record book. In addition, when you finish any project-related work, make an entry in your book. This is the best way to keep accurate, useful record of your activities.

Be sure to read the instructions on each page. Make sure you understand them, and know how to make proper entries in the book. Your parents or your leader can help you get started.

When your record book is complete, turn it over to your local 4-H leader. Your leader will check it for accuracy, sign it, and forward it to your county extension educator.

Save all pictures and newspaper clippings relating to your project. If your record is selected to represent the county in some project or other club activity, you will have all of the material needed to show what you have done. Ask your local leader or county extension educator to explain the awards.

Year 20_____		
Name		Age
Mailing address		Birth date Month / Day / Year ____ / ____ / ____
School grade complete	Years in 4-H/FFA	Years in 4-H/FFA Sugarbeet Project

Sugarbeet Grower Project

OBJECTIVES

1. To stimulate interest in growing sugarbeets
2. To learn effective crop management for sugarbeet production including
 - Fertilization
 - Insect control
 - Marketing
 - Irrigation
 - Disease control
 - Weed control
 - HarvestingAnd to learn how each affects crop quality.
3. To learn about the sugarbeet industry and its opportunities
4. To gain self-confidence and learn responsibility through experience and successful completion of the project.

REQUIREMENTS

You will:

1. Grow a minimum of one acre of sugarbeets as measured by the club leader, instructor, or a field person. Individual contracts with the sugar company are required. A contract may include more than one member.
2. Supply a description of land where you grow sugarbeets.
3. Complete a pesticide report (under chemical costs).
4. Be an active 4-H/FFA member and fulfill meeting and demonstration requirements.
5. Own your own project with a bonafide agreement or contract with your parent or landlord covering machinery, labor, seed, share, etc. Your parent and your leader must sign this.
6. Have your parents or legal guardian co-sign the contract with the sugar company.
7. Attend the annual field tour of sugarbeet projects and give an oral presentation on management practices (what it takes to produce the crop) during the tour.
8. Have an updated record book available for review during the field tour.
9. Exhibit your project at the county fair or an approved alternative.
10. If your crop is not harvested by fair, finish and turn in workbook to your county extension office on or before January 5 of the next calendar year.
11. *Individual project weight slips or market receipts **must** be included with the record book at project completion.*

EXHIBITS

Display of sugarbeets according to the local county fair book.. (Display 3 uniform beets at the county fair.)

OR

Display of sugarbeets at a public exhibit other than the county fair. Talk to your leader and/or extension educator for approval.

AND

Display your completed 4-H project record book and updated Sugarbeet Grower Workbook at the fair.

A special thanks to Amalgamated Sugar Company, Mini-Cassia Beet Growers, and the Minidoka and Casia County Extension Offices for their help in developing this project. Revised February 2004.

Preparing Sugarbeets For Exhibit

Selecting three uniform sugarbeets from your project is not easy. You will have a good exhibit if you know what you want, how to find it, and how to prepare it for an exhibit.

Your exhibit should be representative of your beet crop. Your best beets will be found where the soil is mellow and where there is a good stand. The extra large beets are found at row ends or other areas of the field where a single is isolated from others with no competition. These beets tend to be rougher, with a large multiple crown, and usually have several intertwined roots. Try to select beets that have the following characteristics:

- A. **Uniform** – Beets should be of similar size and shape.
- B. **Size** - Large beets are more desirable than smaller ones.
- C. **Shape** - Beets that are long and thick, with the thickness extending the length of the beet, are more desirable than shorter beets or long beets that do not have much thickness in the lower half or three-quarters. Round beets are preferred to flat.
- D. **Crown** -The crown should be short, small, free from hollow areas, and clean in order for topping to take away only a minimum weight and to keep the tare low.
- E. **Roots** - A beet with a single heavy root is preferred to a multiple root or beet with several intertwined roots. The root should be free of insect damage.

A well-prepared sample of three beets makes a very attractive exhibit. After selecting the desirable beets, remove the dirt by soaking rather than brushing. Brushing and rough handling scratches the skin, which will turn the surface dark. Do not use chlorine bleach as it causes the skin to deteriorate and turn black. Cut the top off square at a point where it will form a two-inch diameter cut. Trim the remainder of the crown at a 30 degree angle from the bottom leaf scar to the square cut. The beet should be able to stand on the crown end with the long tap root standing upright.

Sugarbeet score card:	
SIZE	25 POINTS
UNIFORMITY	25 POINTS
TYPE	30 POINTS
CONFORMATION	10 POINTS
CROWNS	<u>10 POINTS</u>
TOTAL	100 POINTS

Amalgamated Sugar Company has special awards for the best sugarbeets and the largest sugarbeet.

Field Tour and Presentation

The field tour involves a visit to each member's sugarbeet field.

- Arrange for a transportation committee. For safety's sake, it would be wise to use one car or truck driven by an older club member or leader.
- Arrange a time and place for the tour.
- Create a committee to decide on the lunch and drinks, location, and provider.
- Arrange the route of tour, including where you will go and when you plan to be there. A well-planned tour will allow time for everyone to see all the club projects and have time for lunch and recreation.
- At each stop, the 4-H member will give a presentation about their project. If the project is above average or below average, have the club member tell what happened. Presentations need to have a time limit in order to stay on schedule.
- Designate a recreation leader to be in charge of a program at the lunch stop. This person will obtain any necessary equipment.
- Learn by doing.

Field Map

Show the location of your sugarbeet project in relation to the rest of the farm. Indicate the number of acres in your project on the map. Show how the irrigation system is laid out for your project, including details such as head ditches, field ditches, wheel lines, sprinklers, etc.

NORTH



Number of acres in this year's project _____

Number of acres in last year's project _____

Field Map Soil Information

Soil type _____ Soil depth _____ Soil texture _____

Drainage _____ Percent Slope _____ %

What was the crop rotation over the past three years?

Last year _____ Two years ago _____ Three years ago _____

How much fertilizer was applied to the previous crop?

Nitrogen (N) _____ Phosphate (P) _____ Potash (K) _____

Other nutrients and amounts _____

When was manure last applied to soil? _____

Soil Test Results (REQUIRED):

Soil pH _____ Phosphorus (ppm P) _____ Potassium (ppm K) _____

Soil organic matter _____ %

Nitrogen			
Soil depth (inches)	Nitrate nitrogen (ppm N)	Multiply by 4	Available N (Lb per acre*)
0-12	_____	x 4 =	_____
12-24	_____	x 4 =	_____
Total	_____	x 4 =	_____

ppm multiplied by 4 equals available N in lb per acre

Attach Soil Test to Workbook Book Here:

Sugarbeets Budget

(TO BE FILLED OUT AT BEGINNING OF PROJECT YEAR, USE YOUR BEST ESTIMATE OF WHAT IT WILL TAKE TO GROW YOUR CROP)

Number of acres in project _____

ESTIMATED INCOME PER ACRE (\$)	Member	Landlord	Total
1. Estimated yield per acre (cwt)			
2. Estimated price per unit (cwt)			
3. Estimated gross income per acre (line 1 X line 2)			
4. Other income (rental income for landlord)			

ESTIMATED COSTS PER ACRE (\$)	Member	Landlord	Total
4 Cash Rent			
5. Land Cost (mortgage, taxes, insurance)			
6. Water and pump cost (If separate from land cost)			
7. Machinery and equipment (Include all costs from ground preparation to harvest)			
8. Harvest and hauling			
9. Fertilizer			
10 Seed			
11. Chemicals (herbicides, insecticides fungicides, rodenticides)			
12. Labor			
13. Miscellaneous costs			
Total estimated costs per acre (Total for line 4 through 13)			
15 Estimated net income per acre (line 3 minus line 14)			

Example Budget

Table 1. Costs And Returns Per Acre to Produce Sugarbeets
SCI

	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Gross Returns				
Sugarbeets	25.00	ton	39.00	975.00
Total Gross Returns For Sugarbeets				975.00
Operating Costs				
Custom:				
Custom Fertilize	1.00	acre	5.45	5.45
Consultant	1.00	acre	14.50	14.50
Hand Hoeing Beets	1.00	acre	25.00	25.00
Fertilizer:				
Dry Nitrogen	50.00	lb	0.30	15.00
Dry P2O5	80.00	lb	0.20	16.00
K2O	90.00	lb	0.15	13.50
Sulfur	40.00	lb	0.12	4.80
Liquid Nitrogen	20.00	lb	0.33	6.60
Micronutrients	1.00	acre	6.00	6.00
Seed:				
Beet Seed Pellets	0.50	unit	76.00	38.00
Pesticide:				
Counter - CR	9.80	lb	2.70	26.46
Progress	28.00	oz	0.93	24.18
Upbeet	0.51	oz	47.40	24.17
Meth. seed oil	1.50	qt	3.54	5.31
Stinger	2.66	oz	3.82	10.16
Irrigation:				
Irr. Repairs - cp	31.00	acin	0.59	18.29
Irr. Power - cp	31.00	acin	1.37	42.47
Labor (irrigation)	1.88	hr	8.05	14.97
Water Assessment	1.00	acre	26.40	26.40
Other:				
Crop Insurance	1.00	acre	34.00	34.00
Hauling Charge	25.00	ton	0.70	17.50
Labor (machine)	5.91	hrs	12.00	70.90
Labor (non-machine)	2.60	hrs	7.15	18.59
Fuel - Gas	4.02	gal	1.65	6.64
Fuel - Diesel	23.41	gal	1.25	29.27
Lube				5.38
Machinery Repair				34.07
Interest on Operating Capital @ 5.50%				14.88
Total Operating Costs per Acre				568.47
Net Returns Above Operating Costs				406.53
Cash Ownership Costs				
General Overhead				14.00
Land Rent				200.00
Co-op Stock				42.00
Management Fee				49.00
Property Taxes (machinery)				0.00
Property Insurance				2.40
Total Cash Ownership Costs per Acre				307.40
Non-Cash Ownership Costs (depreciation and interest)				
Equipment				80.93
Total Non-Cash Ownership Costs per Acre				80.93
Total Costs per Acre				956.80
Returns to Risk				18.20

Cash Flow Worksheet

Item	Month	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Total
Income														
(1) Contracted sugarbeets														
(2) Uncontracted sugarbeets														
(3) Total Income														
Costs														
(4) Land														
(5) Water														
(6) Equipment														
(7) Harvesting														
(8) Hauling														
(9) Fertilizer														
(10) Seed														
(11) Chemicals														
(12) Labor														
(13) Insurance														
(14) Other														
(15) Other														
(16) Total Costs														
(17) Profit														
(18) Net Cash Flow														

Profit (17) = Total Income (3) minus Total Costs (16); **Net Cash Flow (18)** = month-by-month tally of the profit figure (sum the profit figures from the previous months); Profit (17) and Net Cash Flow (18) will be negative until revenue is received in August

Example Cash Flow

	Nov 00	Dec 00	Jan 01	Feb 01	Mar 01	Apr 01	May 01	Jun 01	Jul 01	Aug 01	Sep 01	Oct 01	Total
Preharvest:													
Disk	4.29												4.29
Plow	11.20												11.20
Fertilize	54.50												54.50
Harrow						4.82							4.82
Plant						77.42							77.42
Ground Spray						20.80	53.62						74.42
Repairs						17.67							17.67
Irrigate						2.92	2.92	14.88	14.55	12.65	7.13	1.30	56.35
Crop Insurance						35.00							35.00
Assessments						24.70							24.70
Cultivate							3.70	3.70					7.41
Consultant								14.50					14.50
Hand Weed								25.00					25.00
Cultivate/basin									4.94				4.94
General Pickup Use	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	24.13
Total Preharvest Costs	72.00	2.01	2.01	2.01	2.01	185.34	62.25	60.09	21.50	14.66	9.14	3.31	436.35
Harvest:													
Top Beets												7.12	7.12
Dig												30.40	30.40
Crop Hauling												39.59	39.59
Hauling Assessment												17.50	17.50
Total Harvest Costs												94.62	94.62
Interest on Operating Capital	0.45	0.46	0.48	0.49	0.50	1.66	2.05	2.42	2.56	2.65	2.71	3.32	19.74
Operating Costs per Acre	72.45	2.47	2.49	2.50	2.51	187.00	64.30	62.51	24.06	17.31	11.85	101.25	550.70
Cash Ownership													
General Overhead	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	21.03
Land Rent					200.00								200.00
Co-op Stock												42.00	42.00
Management Fee	3.85	3.85	3.85	3.85	3.85	3.85	3.85	3.85	3.85	3.85	3.85	3.85	46.25
Property Insurance						2.28							2.28
Cash Ownership Costs	5.61	5.61	5.61	5.61	205.61	7.88	5.61	5.61	5.61	5.61	5.61	47.61	311.56
Total Cash Costs per Acre	78.06	8.08	8.09	8.11	208.12	194.88	69.91	68.12	29.67	22.92	17.46	148.85	862.26

Calculating Water Applied By Revolution or Set

Step 1:

Determine the water depth in 24-hour inches for each irrigation set or cycle from Table 1 (see p. 10), using the appropriate water flow for your system. The head size may be measured in cubic feet per second, Idaho Miner's inches, or gallons per minute.

Step 2:

Select an appropriate irrigation system efficiency from Table 2 on page 10.

Select lower values for 24-hour sets, larger spacing, or windy conditions.

Step 3:

Calculate the application depth using either equation 1 or equation 2, depending upon the irrigation system type.

Equation 1: Water application depth per revolution for center pivot, or per pass for linear-move irrigation systems or partial center pivot system:

Inches of water applied per revolution of a center pivot =

$$\frac{(\text{Table 1 answer}) \times (\text{Table 2 answer}) \times \text{number of days per set}}{\text{acres} \times 100}$$

Example: 130 acre pivot, with flow equal to 900 gpm, efficiency rating (from Table 2) = 85%, 2.5 days per revolution

$$\text{Depth of water applied per revolution} = [47.60 \times 85 \times 2.5] / [130 \times 100] = 0.778 \text{ inch}$$

Equation 2: Water application per set for set-move sprinklers or gravity systems:

Inches of water applied per acre for non-center pivot systems =

$$\frac{(\text{Table 1 answer}) \times (\text{Table 2 answer}) \times \text{hours per set}}{\text{acres} \times 24 \times 100}$$

Example: 6 acres, border irrigation, flow equal to 50 Idaho Miner's inches, efficiency rating (from Table 2) = 50%, 12-hour set depth = $[23.8 \times 50 \times 12] / [6 \times 24 \times 100] = 0.99 \text{ inch}$

Table 1. Calculation of water depth (24-hour inches) applied by head size

Cubic Ft per second	Water flow (Head size)		24-hour inches per acre
	Idaho Miner's inches	Gallon per minute	
0.20	10	90	4.75
0.40	20	180	9.52
0.60	30	270	14.28
0.80	40	360	19.04
1.00	50	450	23.80
1.20	60	540	28.56
1.40	70	630	33.32
1.60	80	720	38.08
1.80	90	810	42.84
2.00	100	900	47.60
2.20	110	990	52.36
2.40	120	1080	57.12
2.60	130	1170	61.88
2.80	140	1260	66.64

Table 2. Typical irrigation system application efficiencies.

System Type	Irrigation System Efficiency* (%)
Surface Systems	
Furrow	35-65
Surge	50-55
Cablegation	50-55
Sprinkler Systems*	
Set-move	60-75
Solid-set	60-85
High pressure center-pivot	65-80
Low pressure center-pivot	75-85
Linear-move	80-87
Microirrigation	
Drip	90-95

- Use lower efficiencies with larger spacing and windy conditions.

Water

Rainfall:

Inches of rainfall received for the months your crop was in the ground:

March _____

April _____

May _____

June _____

July _____

August _____

September _____

Total Rainfall _____ (inches)

Irrigation:

How was water applied? _____

Date of Irrigation	Hours per set	Head Size	Inches of water applied per acre

Total inches of water applied for season: _____

The Project

Soil Preparation:

How was the soil prepared? _____

Planting:

Date of planting _____ Seeding rate (lb/acre) _____

Depth of planting _____ Row width _____

Did the seed receive any treatment? _____ if so, what type? _____

Seed variety _____

Where was seed obtained? _____

Rating of Sugarbeet Stand:

Excellent _____ Good _____ Medium _____ Poor _____

What were the reasons for this condition? _____

Growth Stages in Sugarbeets

Growth stage	Date	Comments
Seed Sprouting		
Emergence		
Row closure		
Top die or burn		

Fertilizer Costs

			Rate	Member cost	Landlord cost	Total cost
Fertilizer nutrient(s)	Date	Method ^a	(units per acre)	(\$ per acre)	(\$ per acre)	(\$ per acre)
Fertilizer cost per acre \$						
(3) TOTAL FERTILIZER COST (cost per acre X number of acres) \$						

Choose the letter representing the method of fertilizing from below:

- (a) broadcast on surface; (b) side-dressed; (c) through irrigation system; (d) banded (near row); (e) preplant injection; (f) foliar; (g) other - please state

Chemical Costs

Chemical	Date	Rate (units per acre)	Reason for use	Member cost (\$ per acre)	Landlord cost (\$ per acre)	Total cost (\$ per acre)
Chemical cost per acre \$						
(4) TOTAL CHEMICAL COST (cost per acre X number of acres) \$						

Other Operating Costs

Include all other items for which cash was expended except seed, machinery and equipment, fertilizer, chemicals, and labor, which are reported in the preceding pages.

Item	Member cost per acre	Landlord cost per acre	Total cost per acre
Land charge, if cash rent is used*			
Water rent, if not included with land			
Consultant			
Storage			
Insurance			
Interest on borrowed money			
Miscellaneous (list)			
Total cost per acre \$			
(6) TOTAL COSTS (cost per acre X number of acres)			

*Land charges include sprinkling system, depreciation and repair, water, and taxes.

Record of Yield and Crop Revenue for Member, Landlord, and Total

Date harvested	Yield (cwt/acre)	Revenue (\$/cwt)	Member revenue (\$/acre)	Landlord revenue (\$/acre)	Total revenue (\$/acre)
(7) TOTAL REVENUE FROM SUGARBEETS (revenue per acre X acres) \$					

Financial Summary

Transfer total costs to this page, not per acre costs.

Receipts

	Member	Landlord	Total
Total value of beans sold, And/or in storage (see (7), pg. 25) TOTAL RECEIPTS \$'			

Costs

	Member	Landlord	Total
Seed (see (1) p. 21)			
Machinery and Equipment use (see (2) p. 21)			
Labor (see (5) p. 23)			
Fertilizer (see (3) p. 22)			
Chemicals (see (4) p. 22)			
Other operating costs (see (6) p. 24)			
Total Costs \$			
Average cost per unit (cwt) (divide total expenses by yield)			
Average cost per acre (divide total expenses by total acres)			
PROFIT or LOSS \$ (total receipts minus total costs)			

This profit (loss) figure represents your income for labor, management, and money invested.

Financial Performance Over Time; A History of Your Project

Transfer "Per Acre Costs" from previous years in the sugarbeet project.

Receipts per acre **This Year** _____ **Last Year** _____ **2 Years ago** _____
 Member Landlord Member Landlord Member Landlord

(a) Total value of sugarbeets sold, and/or in storage (\$)						
(b) Project size (acres)						
(c) Yield (cwt per acre)						
Costs per acre (\$)	This Year _____		Last Year _____		2 Years ago _____	
	Member	Landlord	Member	Landlord	Member	Landlord
Seed						
Equipment use						
Labor						
Fertilizer						
Chemicals						
Other operating costs						
(d) Total costs (\$)						
Avg. cost per unit (cwt) (d)/(c)						
Avg. cost per acre (d)/(b)						
PROFIT OR LOSS (a)-(d)						

Average Values per Acre, Years _____ thru _____ (Determine the average values per acre by adding the total costs or receipts per acre in each row in the table above and divide by the number of years in your project.)

Avg. costs per acre (\$) **Member** **Landlord**

Seed		
Equipment use		
Labor		
Fertilizer		
Chemicals		
Other operating costs		
(e) Total costs (\$)		
(f) Avg. revenue from (a) above		
(g) Avg. project size		
(h) Avg. yield		
Average cost per unit (cwt) (e) / (h)		
Average cost per acre (e) / (g)		
PROFIT OR LOSS (f) - (e)		

THE ORAL PRESENTATION COUNTY SUGARBEET FIELD TOUR

The oral presentation is intended to provide you with an opportunity to learn more about your project and to share your ideas and experiences with others. Your oral presentation will be evaluated as follows:

Organization and Content	Points Possible	Your Score
Opening comments	5	
Background Information (field history and site information)	10	
Knowledge and understanding of practices used (below) Variety Seed treatments Fertilization Planting information Pest control Cultivation practices Seedbed preparation Irrigation scheduling	15	
Presentation Posture Friendliness Pronunciation Ease and confident manner Distinct speech Handling of Questions	20	
General Appearance of Field Field borders Plant population Weed control Insect damage Disease control Appearance of plants	30	
Personal Involvement	20	
100 TOTAL POINTS POSSIBLE	Your Final Score	

Judged by: _____ Date: _____

PARENTS ARE ENCOURAGED TO ATTEND FIELD TOUR!

Your Workbook Score

Workbook will be graded under supervision of an extension educator at end of project year.

Points Possible	Your Score	
Completeness 1. All blanks properly filled	30	
Accuracy 1. Dates and accounts are correct. 2. Record appears logical. 3. Record is kept throughout the year and essential information is entered at proper time.	30	
Results - Story - Questions 1. Record shows good management, development, and care of project. 2. Proper language is used. 3. Record shows that experience was gained and that approved practices were followed 4. Questions are answered properly.	30	
Neatness 1. Writing is legible (pen or pencil) 2. Book is reasonably clean 3. Record shows signs of use.	10	
TOTAL	100	

Graded by: _____ Date: _____

Your County Fair Exhibit Points

	Points Possible	Your Score
Best of Class	5	
Blue Ribbon	20	
Red Ribbon	15	
White Ribbon	5	
Exhibit at Fair	25	
TOTAL	50	

Signed by Club Leader; _____ Date: _____