

Southcentral Idaho: Magic Valley**Spring Malting Barley**

Paul Patterson, Steven Hines and Juliet Marshall.

**Magic Valley****Background and Assumptions**

The University of Idaho's costs and returns estimates are based on economic costs, not accounting costs. All resources are valued at a market rate or "opportunity cost". Input prices are based on data collected annually by the University of Idaho from agricultural supply companies. The selling price for the commodity is an historical average, not a current year's forecast price. The cost estimate shown here is typical for growing spring malting barley under irrigation in the Magic Valley of southcentral Idaho. Production practices are based on data from farmers, crop consultants, and extension personnel. These aren't University of Idaho recommendations. Production practices most closely represent those in Cassia, Minidoka, Jerome, Gooding, and Twin Falls counties. Although production practices may be similar for individual farms, each farm has a unique set of resources with different levels of productivity, different production problems, and therefore different costs. Farm size, crop rotation, age and type of equipment, and the quality and intensity of management are all crucial factors that influence production costs.

The Model Farm

This costs and returns estimate models a 2,200-acre farm with 550 acres in spring malting barley or other grain crops, 550 acres in potatoes, 550 acres in sugarbeets, 150 acres in dry beans, and 400 acres in corn or alfalfa.

The farm uses a center pivot irrigation system and surface water delivered to the farm from an irrigation district. The irrigation district charges a flat fee per acre for water. Irrigation power use is based only on pressurization (no lift). Power costs per acre-inch of water applied are calculated using 2015 Idaho Power Schedule 24 Agricultural Irrigation Service rates. Power costs per acre-inch for water pumped from different depths and for different irrigation systems is found in the annual Crop Input Cost Summary

<http://www.uidaho.edu/cals/idaho-agbiz/crop-enterprise-budgets>

Production Practices

Barley acreage is disk-ripped in the fall, and roller harrowed and planted in the spring in a single-pass operation. Wheat is harvested by the farm operator in August and hauled to a grain elevator and sold.

Storage costs are not included. Harvest cost in grain budgets published prior to 2013 was based on a custom rate.

All fertilizer is custom applied in March before planting. A 2-way herbicide mix is ground applied post emergence to control wild oats and broadleaf weeds. While a foliar fungicide is applied by air, it may not be needed every year. An insecticide may be needed in some years, but none is included because treatment is infrequent and unpredictable. Spring barley receives 20 inches of water during the growing season; 2 inches in April, 6 inches in May, 7 inches in June, and 5 inches in July. The two inches of water applied in the previous fall are also credited to spring barley, for a total of 22 inches.

Machinery

Equipment used to produce irrigated spring barley is shown in Tables 4 and 5. Table 4 lists the equipment and their hourly operating and ownership costs, while Table 5 lists the equipment and their annual ownership costs. Machinery ownership capital recovery cost is based on 75% of the replacement cost of a new piece of equipment, except for trucks. Truck prices are for a used vehicle with a new bed. Capital recovery combines depreciation and interest into a single value. To keep machinery prices current between years in which a comprehensive survey is conducted, machinery prices are adjusted using USDA's Farm Machinery Prices Paid Index. Equipment prices are collected approximately every five years.

The University of Idaho uses the budget generator program *Budget Planner* from the University of California-Davis to produce the various tables shown in this publication. Machinery operating and ownership costs are calculated based on engineering equations in this program. Machinery operating costs include fuel, lubricants and repairs.

Labor and Management

The cost of labor used in this publication includes a base wage, plus a percentage to account for various payroll taxes (FICA, SUTA & FUTA), and workman's compensation, as well as benefits such as paid vacation/personal leave days, health insurance and bonuses. Labor is classified by the type of work performed. Labor classifications, labor rates and payroll overhead are shown below.

Labor Values

Labor Class	Base Rate	Payroll Overhead	Effective Rate
General Farm Labor	\$9.25	15%	\$10.65
Truck Drivers	\$12.50	15%	\$14.40
Equipment Operators	\$14.80	25%	\$18.50
Irrigation Labor			
Set Move: HL & WL	\$10.10	30%	\$13.15
Continuous Move: CP & L	\$14.80	25%	\$18.50

Set Move includes: handlines and wheellines

Continuous Move includes: center pivots and linear move

Payroll overhead for set move systems includes housing

Based on the speed, width and overall field efficiency, *Budget Planner* calculates equipment operator labor hours for all field operations except those performed on a custom basis. Custom operations are listed separately. General farm labor accounts for extra field labor used during planting or harvest. A management fee based on approximately 5% of the total production costs is included. Prior to 2013, the basis of the 5% charge was expected revenue.

Capital, Land and Overhead Costs

Interest on operating capital is charged from the time an input is applied until harvest and is calculated at a nominal rate of 5.75 percent. Interest on intermediate term capital, primarily equipment, is calculated using a nominal rate of 5.5 percent. A general overhead charge, calculated at approximately 2.5 percent of operating expenses, is included to cover unallocated whole-farm costs such as office expenses, legal and accounting fees, cell phones, internet service and utilities. Irrigation power is not included as part of general farm utilities.

Land rent is based on a one-year cash lease for grain and covers the irrigation system ownership costs (depreciation, interest, and insurance). Since charges for irrigation water, repairs and power costs are listed separately, land rent may appear low because land owners pay some or even all these expenses in many cash leases.

Budget Format

In addition to the Background and Assumption pages, this publication has six tables presenting a variety of cost and returns information.

Table 1 shows both expected revenue, based on a specified yield and price, and expenses. Expenses are broken into two main categories: operating and ownership. Operating expenses are those that typically vary with the level of production and involve inputs that are used in a single production cycle. Ownership expenses include a systematic cost recovery over the useful life for

inputs used in the production process that have a useful life of more than one year. Machinery and land fall into this category. Operating inputs are organized by category. In addition to the cost per unit and cost per acre for each input, a total cost is given for each category. Table 1 also gives a total of all operating, ownership and total costs per acre, as well as these same categories on a yield basis (per bushel, cwt, ton, etc.).

Table 2 has most of the same cost information presented in Table 1 but the data is organized by operation for both pre-harvest and harvest costs. Operations can define a single activity, such as seed hauling, or multiple activities as in the case of tillage. The quantity of labor is shown for each operation. The cash costs per acre for labor, machinery costs, materials and custom are also specified. Cash overhead expenses are listed separately as are the non-cash overhead.

Table 3 is a monthly cash flow of expenses based on when the operation occurs and when inputs are applied. Field operations are classified as pre-harvest, harvest and post-harvest.

Table 4 lists the equipment used to produce this crop and the costs per hour to operate this equipment. Total annual hours of use for the current crop and for all crops on the farm is also shown.

Table 5 lists the purchase price and salvage value of equipment used to produce this crop, as well annual capital recovery and cash overhead expenses.

Table 6 provides a ranging analysis, sometime referred to as a sensitivity analysis. Table 6 shows how the costs and returns per acre will vary as the yield and/or price ranges above and below the base values from Table 1.

Authors

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Disclaimer

The practices and chemicals specified in the publication are not recommendations. Always read and follow the directions printed on the pesticide label. Due to constantly changing pesticide laws and labels, some pesticides may have been cancelled or had certain uses prohibited. The use of trade names for various products simplifies presentation of this material and should not be considered an endorsement, nor is any criticism implied of similar products not mentioned.

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TABLE 1. COSTS AND RETURNS PER ACRE TO PRODUCE SPRING MALTING BARLEY

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
Malting Barley	130.00	bu	5.75	747.50	
TOTAL GROSS RETURNS	130.00	bu		747.50	
OPERATING COSTS					
Seed:				28.60	
Malting Barley Seed - Spring	110.00	lb	0.26	28.60	
Fertilizer:				73.35	
Dry Nitrogen	90.00	lb	0.55	49.50	
Dry P2O5	45.00	lb	0.53	23.85	
Pesticide:				48.41	
Axial Star	16.40	fl oz	1.13	18.53	
Starane NXT	20.00	fl oz	0.66	13.20	
Headline	6.00	fl oz	2.78	16.68	
Custom:				26.75	
Custom Fertilize: 0 - 400 lbs	1.00	acre	7.25	7.25	
Custom Haul: barley	130.00	bu	0.15	19.50	
Irrigation:				98.62	
Irrigation Power - CP	22.00	ac-in	1.90	41.80	
Water Assessment	1.00	acre	45.60	45.60	
Irrigation Repairs - CP	22.00	ac-in	0.51	11.22	
Other:				24.00	
Crop Insurance	1.00	acre	24.00	24.00	
Labor				52.06	
Equipment Operator Labor	1.64	hrs	18.50	30.29	
General Farm Labor	0.52	hrs	10.65	5.49	
Irrigation Labor: CP	0.88	hrs	18.50	16.28	
Machinery				34.24	
Fuel-Gas	2.51	gal	2.50	6.29	
Fuel-Diesel	5.01	gal	2.30	11.53	
Fuel-Road Diesel	0.12	gal	2.85	0.35	
Lube				2.72	
Machinery Repair				13.35	
Interest on Operating Capital @ 5.75%				9.07	
TOTAL OPERATING COSTS/ACRE				395.11	
TOTAL OPERATING COSTS/BU				3.04	
NET RETURNS ABOVE OPERATING COSTS				352.39	

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TABLE 1. CONTINUED

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
CASH OVERHEAD COSTS					
General Overhead				10.00	
Land Rent				250.00	
Management Fee				30.00	
Property Taxes				0.00	
Property Insurance				1.52	
Investment Repairs				0.00	
TOTAL CASH OVERHEAD COSTS/ACRE				291.52	
TOTAL CASH OVERHEAD COSTS/BU				2.24	
TOTAL CASH COSTS/ACRE				686.63	
TOTAL CASH COSTS/BU				5.28	
NET RETURNS ABOVE CASH COSTS				60.87	
NON-CASH OVERHEAD COSTS (Capital Recovery)					
Equipment				55.67	
TOTAL NON-CASH OVERHEAD COSTS/ACRE				55.67	
TOTAL NON-CASH OVERHEAD COSTS/BU				0.43	
TOTAL COST/ACRE				742.30	
TOTAL COST/BU				5.71	
NET RETURNS ABOVE TOTAL COST				4.70	

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TABLE 2. COSTS PER ACRE TO PRODUCE SPRING MALTING BARLEY

Operation	Operation	Cash and Labor Costs per Acre					Total Cost	Your Cost
	Time (Hrs/A)	Labor Cost	Fuel	Lube &Repairs	Material Cost	Custom/ Rent		
Preharvest:								
Tillage	0.15	5.22	4.83	5.31	0.00	0.00	15.36	
Irrigation	0.00	16.28	0.00	0.00	41.80	0.00	58.08	
Applying Fertilizer	0.00	0.00	0.00	0.00	73.35	7.25	80.60	
Crop Insurance	0.00	0.00	0.00	0.00	24.00	0.00	24.00	
Irrigation Water Assessment	0.00	0.00	0.00	0.00	45.60	0.00	45.60	
Irrigation Repairs	0.00	0.00	0.00	0.00	11.22	0.00	11.22	
Seed Hauling	0.02	0.37	0.04	0.04	0.00	0.00	0.45	
Roller Harrow & Plant	0.11	3.82	2.73	3.48	28.60	0.00	38.63	
Applying Pesticides	0.04	1.27	0.57	0.23	48.41	0.00	50.48	
General Pickup Use	0.74	16.47	6.17	2.43	0.00	0.00	25.07	
General 4-Wheeler Use	0.13	2.96	0.11	0.09	0.00	0.00	3.17	
Service Truck Use	0.02	0.48	0.15	0.06	0.00	0.00	0.70	
Fuel Truck Use	0.02	0.48	0.15	0.07	0.00	0.00	0.71	
TOTAL PREHARVEST COSTS	1.23	47.34	14.75	11.73	272.98	7.25	354.06	
Harvest:								
Combine	0.13	4.71	3.41	4.35	0.00	0.00	12.47	
Crop Hauling	0.00	0.00	0.00	0.00	0.00	19.50	19.50	
TOTAL HARVEST COSTS	0.13	4.71	3.41	4.35	0.00	19.50	31.97	
Interest on Operating Capital at 5.75%							9.07	
TOTAL OPERATING COSTS/ACRE	1.36	52.06	18.16	16.08	272.98	26.75	395.11	

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TABLE 2. CONTINUED

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TABLE 3. MONTHLY COSTS PER ACRE TO PRODUCE SPRING MALTING BARLEY

	OCT 14	NOV 14	DEC 14	JAN 15	FEB 15	MAR 15	APR 15	MAY 15	JUN 15	JUL 15	AUG 15	Total
Preharvest:												
Tillage	15.36											15.36
Irrigation	5.28						5.28	15.84	18.48	13.20		58.08
Applying Fertilizer						80.60						80.60
Crop Insurance							24.00					24.00
Irrigation Water Assessment							45.60					45.60
Irrigation Repairs							11.22					11.22
Seed Hauling							0.45					0.45
Roller Harrow & Plant							38.63					38.63
Applying Pesticides								50.48				50.48
General Pickup Use	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	25.07
General 4-Wheeler Use	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	3.17
Service Truck Use	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.70
Fuel Truck Use	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.71
TOTAL PREHARVEST COSTS	23.33	2.69	2.69	2.69	2.69	83.29	127.88	69.01	21.17	15.89	2.69	354.06
Harvest:												
Combine											12.47	12.47
Crop Hauling											19.50	19.50
TOTAL HARVEST COSTS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	31.97	31.97
Interest on Operating Capital @5.75%	0.11	0.12	0.14	0.15	0.16	0.56	1.18	1.51	1.61	1.68	1.85	9.07
TOTAL OPERATING COSTS/ACRE	23.44	2.82	2.83	2.85	2.86	83.86	129.05	70.52	22.78	17.58	36.52	395.11
CASH OVERHEAD												
General Overhead	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	10.00
Land Rent						250.00						250.00
Management Fee	2.73	2.73	2.73	2.73	2.73	2.73	2.73	2.73	2.73	2.73	2.73	30.00
Property Taxes												0.00
Property Insurance							1.52					1.52
Investment Repairs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL CASH OVERHEAD COSTS	3.64	3.64	3.64	3.64	3.64	253.64	5.16	3.64	3.64	3.64	3.64	291.52
TOTAL CASH COSTS/ACRE	27.08	6.46	6.47	6.48	6.49	337.49	134.21	74.16	26.42	21.21	40.15	686.63

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TABLE 4. HOURLY EQUIPMENT COSTS

Yr	Description	Spring Malting Barley	Total	Cash Overhead			Operating			Total Costs/Hr.
		Hours Used	Hours Used	Capital Recovery	Insur- ance	Taxes	Lube& Repairs	Fuel	Total Oper.	
15	4-wheeler	73	150	3.95	0.12	0.00	0.71	0.83	1.54	5.61
15	Grain Drill - 24'	60	65	53.62	1.42	0.00	7.00	0.00	7.00	62.04
15	Pickup 1 - 3/4 ton	138	750	8.57	0.16	0.00	3.28	8.32	11.60	20.33
15	Pickup 2 - 3/4 ton	138	750	8.57	0.16	0.00	3.28	8.32	11.60	20.33
15	Tractor 2 -200hp	66	500	22.61	0.80	0.00	11.57	22.70	34.27	57.67
15	Truck 1P 10-Wheeler	9	370	19.06	0.60	0.00	2.52	2.57	5.09	24.75
15	Tractor - 125hp	22	200	33.48	1.18	0.00	4.06	14.17	18.23	52.89
15	Tractor - 250hp	90	500	30.96	1.09	0.00	15.59	29.39	44.98	77.03
15	Disk-Ripper 13'	82	165	26.41	0.70	0.00	18.44	0.00	18.44	45.54
15	Roller Harrow 24'	60	125	37.07	1.07	0.00	12.18	0.00	12.18	50.31
15	Combine 25' Grain	82	225	153.42	3.86	0.00	29.33	23.00	52.33	209.62
15	Sprayer - 50' 200 gal	20	100	4.29	0.12	0.00	1.97	0.00	1.97	6.39
15	Pickup 3 - 3/4 ton	66	325	11.91	0.34	0.00	3.28	8.32	11.60	23.85
15	Pickup 4 - 3/4 ton	66	325	11.91	0.34	0.00	3.28	8.32	11.60	23.85
15	Service Truck	12	80	36.69	1.21	0.00	2.87	7.13	9.99	47.89
15	Fuel Truck	12	80	46.10	1.49	0.00	3.32	7.13	10.44	58.04

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TABLE 5. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT, AND BUSINESS OVERHEAD COSTS

ANNUAL EQUIPMENT COSTS

Yr	Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead		Total
						Insur- ance	Taxes	
15	4-wheeler	6,000.00	10	1,772.31	658.36	19.43	0.00	677.79
15	Grain Drill - 24'	36,000.00	12	4,986.24	3,872.75	102.47	0.00	3,975.21
15	Pickup 1 - 3/4 ton	41,000.00	5	13,750.00	7,137.56	136.88	0.00	7,274.43
15	Pickup 2 - 3/4 ton	41,000.00	5	13,750.00	7,137.56	136.88	0.00	7,274.43
15	Tractor 2 -200hp	157,000.00	20	20,144.91	12,559.91	442.86	0.00	13,002.77
15	Truck 1P 10-Wheeler	95,000.00	20	4,000.00	7,834.82	247.50	0.00	8,082.32
15	Tractor - 125hp	93,000.00	20	11,932.97	7,439.95	262.33	0.00	7,702.28
15	Tractor - 250hp	215,000.00	20	27,586.97	17,199.88	606.47	0.00	17,806.35
15	Disk-Ripper 13'	45,000.00	12	6,232.80	4,840.93	128.08	0.00	4,969.01
15	Roller Harrow 24'	54,000.00	15	5,184.35	5,148.43	147.96	0.00	5,296.39
15	Combine 25' Grain	325,000.00	10	61,305.01	38,355.60	965.76	0.00	39,321.36
15	Sprayer - 50' 200 gal	5,000.00	15	480.03	476.71	13.70	0.00	490.41
15	Pickup 3 - 3/4 ton	41,000.00	12	7,500.00	4,299.48	121.25	0.00	4,420.73
15	Pickup 4 - 3/4 ton	41,000.00	12	7,500.00	4,299.48	121.25	0.00	4,420.73
15	Service Truck	40,000.00	20	3,000.00	3,261.14	107.50	0.00	3,368.64
15	Fuel Truck	50,000.00	20	3,000.00	4,097.93	132.50	0.00	4,230.43
TOTAL		1,285,000.00	-	192,125.58	128,620.47	3,692.81	0.00	132,313.28
90% of New Cost*		1,156,500.00	-	172,913.03	115,758.42	3,323.53	0.00	119,081.95

*Used to reflect a mix of new and used equipment

ANNUAL INVESTMENT COSTS

Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead			Total
					Insur- ance	Taxes	Repairs	
INVESTMENT								
TOTAL INVESTMENT	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/ Farm	Unit	Price/ Unit	Total Cost
General Overhead	550	acre	10.00	5,500.00
Land Rent	550	acre	250	137,500.00
Management Fee	550	acre	30.00	16,500.00

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TABLE 6. RANGING ANALYSIS - SPRING MALTING BARLEY

COSTS PER ACRE AND PER BU AT VARYING YIELDS TO PRODUCE SPRING MALTING BARLEY

	YIELD(BU)						
	115.00	120.00	125.00	130.00	135.00	140.00	145.00
OPERATING COSTS/ACRE:							
Preharvest	354.06	354.06	354.06	354.06	354.06	354.06	354.06
Harvest	29.72	30.47	31.22	31.97	32.72	33.47	34.22
Interest on Operating Capital @ 5.75%	9.06	9.07	9.07	9.07	9.08	9.08	9.08
TOTAL OPERATING COSTS/ACRE	392.84	393.60	394.35	395.11	395.86	396.61	397.37
TOTAL OPERATING COSTS/BU	3.42	3.28	3.15	3.04	2.93	2.83	2.74
CASH OVERHEAD COSTS/ACRE	291.52	291.52	291.52	291.52	291.52	291.52	291.52
TOTAL CASH COSTS/ACRE	684.37	685.12	685.87	686.63	687.38	688.13	688.89
TOTAL CASH COSTS/BU	5.95	5.71	5.49	5.28	5.09	4.92	4.75
NON-CASH OVERHEAD COSTS/ACRE	55.67	55.67	55.67	55.67	55.67	55.67	55.67
TOTAL COSTS/ACRE	740.04	740.79	741.55	742.30	743.05	743.81	744.56
TOTAL COSTS/BU	6.44	6.17	5.93	5.71	5.50	5.31	5.13

Net Return Per Acre Above Operating Costs For Spring Malting Barley

PRICE (\$/bu)	YIELD (bu/acre)						
Malting Barley	115.00	120.00	125.00	130.00	135.00	140.00	145.00
5.00	182.16	206.40	230.65	254.89	279.14	303.39	327.63
5.25	210.91	236.40	261.90	287.39	312.89	338.39	363.88
5.50	239.66	266.40	293.15	319.89	346.64	373.39	400.13
5.75	268.41	296.40	324.40	352.39	380.39	408.39	436.38
6.00	297.16	326.40	355.65	384.89	414.14	443.39	472.63
6.25	325.91	356.40	386.90	417.39	447.89	478.39	508.88
6.50	354.66	386.40	418.15	449.89	481.64	513.39	545.13

Net Return Per Acre Above Cash Costs For Spring Malting Barley

PRICE (\$/bu)	YIELD (bu/acre)						
Malting Barley	115.00	120.00	125.00	130.00	135.00	140.00	145.00
5.00	-109.37	-85.12	-60.87	-36.63	-12.38	11.87	36.11
5.25	-80.62	-55.12	-29.62	-4.13	21.37	46.87	72.36
5.50	-51.87	-25.12	1.63	28.37	55.12	81.87	108.61
5.75	-23.12	4.88	32.88	60.87	88.87	116.87	144.86
6.00	5.63	34.88	64.13	93.37	122.62	151.87	181.11
6.25	34.38	64.88	95.38	125.87	156.37	186.87	217.36
6.50	63.13	94.88	126.63	158.37	190.12	221.87	253.61

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TABLE 6. RANGING ANALYSIS CONTINUED

Net Return Per Acre Above Total Costs For Spring Malting Barley

PRICE (\$/bu)	YIELD (bu/acre)						
Malting Barley	115.00	120.00	125.00	130.00	135.00	140.00	145.00
5.00	-165.04	-140.79	-116.55	-92.30	-68.05	-43.81	-19.56
5.25	-136.29	-110.79	-85.30	-59.80	-34.30	-8.81	16.69
5.50	-107.54	-80.79	-54.05	-27.30	-0.55	26.19	52.94
5.75	-78.79	-50.79	-22.80	5.20	33.20	61.19	89.19
6.00	-50.04	-20.79	8.45	37.70	66.95	96.19	125.44
6.25	-21.29	9.21	39.70	70.20	100.70	131.19	161.69
6.50	7.46	39.21	70.95	102.70	134.45	166.19	197.94