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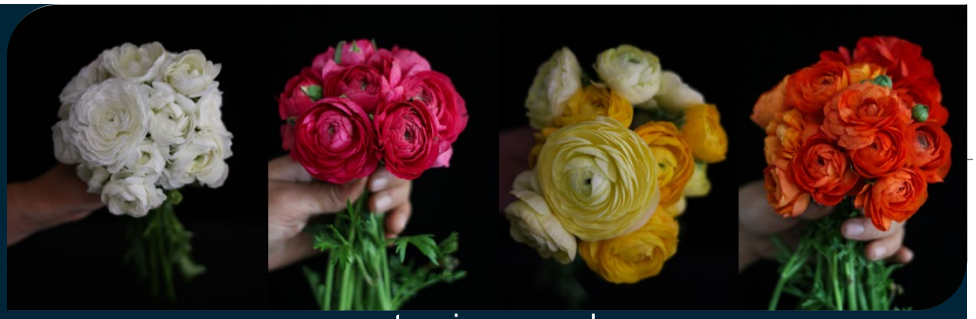

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Ranunculus Cut Flower Production Budget, One Field, Northern Utah, 2022

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This budget contains costs (preplant and site preparation, establishment and maintenance, and harvest and processing) and returns for the production and sale of ranunculus cut flowers that were grown in a field (14 feet by 40 feet). Production methods, yield, costs, and pricing were determined from Utah State University (USU) research trials, as well as feedback from Northern Utah producers. Typical production in Northern Utah is highly variable, with net returns influenced by labor costs, management practices, yield, stem length, and marketing success. Based on USU research trials, ranunculus results in an *economic loss* of $0.95 per square foot when grown as a field cut flower crop in Northern Utah and sold at wholesale pricing. Wasatch Front trials indicate greater yields are possible and potentially profitable, but growers should evaluate the risk and return potential for their unique situation.

Farm and Production System

This publication assumes the use of one 14-foot x 40-foot field with two beds, each 4 feet x 36 feet and 6.5 feet apart from center to center (i.e., 288 square feet of production space), using color mixes of 'Amandine' and 'LaBelle' ranunculus planted in native soil at a 6-inch x 6-inch spacing (994 total plants) with drip irrigation. Ranunculus tuberous roots are soaked in water for 3 hours and fungicide for an additional 20 minutes before planting in March. A field this size uses less than 2% of one acre and is assumed to be on land already owned. However, $45 is used as a proxy for the land cost (1% of a $4,550 per acre lease) with the assumption that urban land rental is greater than rural (NASS, 2022).

Crop Pricing

Stem pricing was calculated based on wholesale market testing conducted with florists across Cache Valley and the Wasatch Front from April through July of 2021 and 2022. Average prices were used to calculate revenues in Table 1. High-quality, marketable stems were sold in bunches of 10 stems for $15.00 ($1.50 per stem). Stems were harvested when blooms were fully colored at the 'marshmallow' stage and graded as marketable when they were at least 10 inches long, straight, and undamaged. Cull stems were shorter than 10 inches, deformed, or damaged. Stems were sold through a local cut flower co-op located approximately five miles from the farm for a fee of 30% of revenue, which is calculated as 100% of marketable stems sold. Labor and mileage for delivery to the co-op, as well as the co-op fee, which includes the cost of cold storage, are included in budget expenses.

Calculated Yield

A yield of 1.2 marketable stems per plant, equivalent to 1,190 stems (119 bunches) across a 2-week harvest period, was used to calculate the revenue in Table 1. This represented the average yield from the highest-yielding, lowest-cost combination of management practices tested in USU trials in North Logan, UT (see the Management Practices subsection of Net Returns and Other Considerations on Page 3 for more information). On-farm field trials across the Wasatch Front resulted in an average marketable yield of 2.3 stems per plant, with only two out of twelve growers obtaining marketable yields over 5 stems per plant. The net returns associated with varying marketable yield from 1 to 5 stems per plant are presented in Table 2.

Supplies

Production supply costs were calculated for a nonpre-sprouted mid-March planting of ranunculus tuberous roots. Costs were based on average prices available in Logan, UT, and online in summer 2022, and may vary across regions, suppliers, and time. All supplies must be purchased in year 1, but many last multiple years. Therefore, the cost of each input is annualized across the quantity used per year and the number of years until replacement.

Preplant and Site Preparation

- Tiller rental. One, half-day rental annually.
- Urea fertilizer (46-0-0): Each year, 2 pounds of a 5-pound bag are needed, so one 5-pound bag is purchased every two years.
- Triple super phosphate fertilizer (0-45-0): Each year, 1.4 pounds of a 5-pound bag are needed, so one 5-pound bag is purchased every three years.
- Muriate of potash fertilizer (0-0-60): Each year, 1.2 pounds of a 5-pound bag are needed, so one 5-pound bag is purchased every four years.
- Drip irrigation kit: Each year, 320 feet of dripline will be used and replaced from a kit with 1000 feet of dripline. A new kit is purchased every three years.

Establishment and Growth

- Ranunculus plant stock: Assuming that all tuberous roots are replaced annually, 994 tuberous roots are needed each year.
- Captan fungicide: Each year, 2 ounces of an 8-ounce bottle are needed, so one 8-ounce bottle is purchased every four years.
- Water usage: One field requires 16 irrigation events, with 128 gallons of water applied per event, resulting in the use of 2,000 gallons of culinary water from March through June. However, irrigation frequency and amount are dependent on month and environmental conditions. The price of water per 1,000 gallons varies across Utah, and a mean residential rate of $2.48 per 1000 gallons is used here (Utah Division of Drinking Water, 2015).
- Low tunnel frames for shade: Initial low tunnel frame construction costs for two, 36-foot beds (see Rauter et al., 2021) were divided by the number of years until materials need to be replaced to determine the annual cost.
- Shade cloth: The south side of the low tunnel frames are covered with 30% shade cloth to reduce heat stress and increase stem length. One, 6-foot x 100-foot shade cloth piece is cut in half to cover two beds. New shade cloth is purchased every eight years.
- Ant bait: One package contains 24 bait stations, and six packets are used each year. One package is purchased every four years.

Harvest and Processing

- Harvest snips: One pair is replaced after two years.
- Buckets: Six, 5-gallon buckets are needed each year and should be replaced every four years.
- Floral preservative: Each year, 1 pound of a 5-pound package is used, so one package is purchased every five years.
- Rubber bands: One, 1 pound bag is purchased and used each year.
- Bouquet sleeves: Bunches are wrapped before sale based on florist preference. One square of brown kraft paper can be cut in half to wrap two bunches of flowers; one bundle of 2200 kraft paper squares is purchased every four years.

Hired Labor

Labor was priced at $16.80 per hour ($15.00 per hour plus employer-related costs), per feedback from local growers and within the mid-range of non-supervisory wages reported by the ERS (2022). Labor costs may vary depending on region and experience. The most time-consuming tasks are typically weeding (when no landscape fabric is used), harvesting, and bunching stems (processing), making streamlining these steps the most critical to reduce labor costs.

Net Returns and Other Considerations

Using the assumptions above, *the net losses* from a 14-foot x 40-foot field are $530.19 ($0.95 per square foot) for the harvest period (Table 1). Based on these costs, a yield of 1.8 stems per plant would be required to break even (Table 2). Multiple factors may significantly impact net returns, including yield, pricing differences across sales outlets and geographical areas, management practices, and labor costs. Some of these factors are discussed below.

Markets and Yield

In milder climates or high tunnel production, ranunculus marketable yields often range from 3 to 6 stems per plant (Rauter et al., 2022). However, in Northern Utah, field yields are limited by a narrow window of optimal

temperatures, with risk of cold injury until May and heat after May causing flower production to stop by late June. In Utah field trials, marketable yields never exceeded 2 stems per plant in North Logan and were between 1 and 5 stems per plant for most growers across the Wasatch Front.

The returns in Table 1 are based on selling 1.2 marketable stems per plant in a wholesale market. Both the number of marketable stems and percentage that can be sold will vary. Table 2 shows the returns associated with altering the percent of stems sold from 50% to 100% and yield from 1 to 5 stems per plant. A minimum marketable yield of 1.8 stems per plant and 100% sold is required to generate positive economic returns, while lower yields or a lower percentage sold at wholesale would result in negative returns. Depending on local demand, 8- to 10-inch stems may be marketable at a reduced price (e.g., $12.50 per bunch of ten stems) to increase revenue but were not included in this budget.

There are other items that can affect net returns. Some cut flower farms sell directly to the final customer, such as at farmers markets or through subscriptions. Selling flowers as arrangements or adding on-farm experiences are other ways that farms may add additional returns. This budget is meant to look at ranunculus production only and does not consider these alternatives.

Management Practices

Management practices, such as cultivar selection, planting date, winter insulation, and pre-sprouting, can also influence net returns. Based on USU research trials in North Logan, UT from 2020 to 2022, planting nonpre-sprouted tuberous roots as soon as the ground was workable in March with no frost protection resulted in the greatest yield (1.2 stems per plant) with the lowest expenses. Planting nonpre-sprouted tuberous roots in November and covering with fabric low tunnels and straw mulch increased yield to 1.6 stems per plant but did not decrease net economic losses due to the added supply and labor expenses of using low tunnels and mulch. Table 3 shows the net losses associated with the other combinations of management practices tested.

Summary

Based on USU research trials, ranunculus results in an economic loss when grown as a field cut flower crop in Northern Utah and sold at wholesale pricing. Yields from trials across the Wasatch Front could be profitable, but costs and returns will vary for individual growers. Trialing a small number of ranunculus plants in the field to determine yield potential before growing a full field is recommended to minimize economic losses. Additionally, revenues can be increased by finding markets for short stems, such as direct-to-consumer sales outlets.

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Table 1. Ranunculus cut flower production budget based on one, 14-foot x 40-foot field (June harvest). Costs are based on a nonpre-sprouted, mid-March planting of tuberous roots (TRs).

REVENUES						
	Output	**Units**	**Total Bunches**	**% Sold**	**Price/Unit**	**Total**
	Marketable	Bunches	119	100%	$15.00	$1,785.00
TOTAL REVENUES						**$1,785.00**

OPERATING EXPENSES						
Supplies	**Input**	**Units**	**Price/ Unit**	**Quantity**	**Years to Replacement**	**Annual Expense**
Preplant & Site Preparation	Tiller rental	Half day rental	$50.00	1	1	$50.00
	Urea fertilizer (46-0-0)	5-pound bag	$16.00	1	2	$8.00
	Muriate of K fertilizer (0-0-60)	5-pound bag	$16.00	1	4	$4.00
	Triple super phosphate fertilizer (0-45-0)	5-pound bag	$16.00	1	3	$5.33
	Drip irrigation kit	Kit	$170.00	1	3	$56.67
Establishment & Maintenance	Ranunculus TRs, 5-7 cm	100 TRs	$52.00	10	1	$520.00
	Captan fungicide	8-ounce bottle	$16.00	1	4	$4.00
	Low tunnel frames for shade	36-foot low tunnel	$27.00	2	1	$54.00
	Water usage	1000 gallons	$2.48	2	1	$4.96
	Shade cloth	6- x 100-foot cloth	$125.00	1	8	$15.63
	Ant bait	24 pack	$26.00	1	4	$6.50
Harvest & Storage	Harvest snips	Snip	$22.00	1	2	$11.00
	Buckets	Bucket	$5.00	6	4	$7.50
	Preservative	5-pound bucket	$22.00	1	5	$4.40
	Rubber bands	1-pound bag	$10.00	1	1	$10.00
	Kraft paper sheets	1 bundle (2200 sheets)	$86.00	1	4	$21.50
Total Supply Expenses						**$783.49**

OPERATING EXPENSES CONTINUED					
Labor	**Input**	**Units**	**Quantity**	**Wage**	**Annual Wage**
Preplant & Site Preparation	Soil tillage	Hours	2	$16.80	$33.60
	Apply fertilizer	Hours	0.5	$16.80	$8.40
	Install irrigation	Hours	1	$16.80	$16.80
Establishment & Maintenance	Planting labor	Hours	5	$16.80	$84.00
	Pesticide applications	Hours	0.5	$16.80	$8.40
	Hand weeding	Hours	16	$16.80	$268.80
	Install shade	Hours	5	$16.80	$84.00
Harvest & Marketing	Harvest	Hours	12	$16.80	$201.60
	Processing	Hours	12	$16.80	$201.60
	Delivery to co-op	Hours	2	$16.80	$33.60
Total labor expenses					**$940.80**

Delivery Fees	**Description**	**Units**	**Quantity**	**Revenue**	**Fee**	**Total Cost**
	30% delivery charge from co-op	Bunches	119	$1,785.00	30%	$535.50
	Mileage to co-op	Miles	20		$0.52 per mile	$10.40
TOTAL OPERATING EXPENSES						$2,270.19

OWNERSHIP COSTS	
Land	$45.00
TOTAL OWNERSHIP COSTS	**$45.00**

TOTAL COSTS	**$2,315.19**
NET PROJECTED RETURNS (per 14-foot x 40-foot field)	**-$530.19**
NET PROJECTED RETURNS (per square foot)	**-$0.95**

Table 2. Stem yield and marketing sensitivity on net projected returns for ranunculus cut flowers grown in a field. Net returns were calculated by adjusting the percent sold and yield of marketable stems (>10-inch length) per plant.

	Net Projected Returns[a] (per square foot)				
Yield / % Sold	1	2	3	4	5
	----------stems per plant[b]----------				
50%	-$2.25	-$1.31	-$0.38	$0.55	$1.48
75%	-$1.78	-$0.38	$1.02	$2.41	$3.81
100%	-$1.31	$0.55	$2.41	$4.28	$6.14

[a] Calculations assume a price of $15 per bunch of 10 stems.

[b] For comparison, the average ranunculus yield from two years of on-farm field trials across the Wasatch Front was 2.3 marketable stems per plant, although growers defined marketability differently, with marketable stem length minimums ranging from 6 to 12 inches.

Table 3. Management practice sensitivity on net projected returns for ranunculus cut flowers grown in a field. Management practices included planting dates of November, March, and April for tuberous roots that were directly planted (-PS) or pre-sprouted (+PS) and either left bare or covered with straw mulch, a fabric low tunnel, or a fabric low tunnel and straw mulch over the winter. Cells for March and April plantings with mulch are left blank since the mulch was removed before spring plantings.

	Net Projected Returns[a] (per square foot)							
Planting Date	No insulation		Mulch		Low tunnel[c]		Low tunnel and mulch	
	-PS	+PS[b]	-PS	+PS	-PS	+PS	-PS	+PS
November	-$2.21	-$2.69	-$1.68	-$2.50	-$1.01	-$2.25	-$1.02	-$2.00
March	-$0.95	-$1.06	-	-	-$1.14	-$1.38	-	-
April	-$1.95	-$1.93	-	-	-$1.96	-$2.17	-	-

[a] Returns were calculated using the same inputs as Table 1, assuming 100% of marketable stems were sold at a price of $15 per bunch of 10 stems, with yield and labor costs adjusted based on Utah State University research trials from 2020-22.

[b] Pre-sprouted tubers were soaked and established in trays of moist potting mix for 2 weeks before planting.

[c] Low tunnels consisted of AG50 frost fabric over conduit hoops from planting until late April.