



AG Talk Report

UNIVERSITY OF IDAHO, U.S. DEPARTMENT OF AGRICULTURE, AND IDAHO COUNTIES COOPERATING

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WATER UPDATE

INPUT COSTS: GLOBAL AND NATIONAL OVERVIEW

IDAHO OVERVIEW OF INPUT COSTS

Eastern Idaho Water Supply Update for Fall

Information compiled by Keith Esplin, Executive Director, Eastern Snake Plain Aquifer Recharge

Keith Esplin, Executive Director of Eastern Idaho Water Rights Coalition (EIWRC), and Eastern Snake Plain Aquifer Recharge (ESPAR), sent an email on October 12, 2022 with the following information that we thought might interest our readers (he graciously granted us permission to reprint it here, with slight editing for format).

Two recent meetings that Esplin attended gave a recap of the 2022 water supply year (ended September 30), the current status, and outlook for next year. Information in this report came from the following sources:

- Bureau of Reclamation
- Rob Van Kirk at the Henry's Fork Foundation
- NRCS
- NOAA
- Water District #01

Esplin wrote:

"2022 Water Season Recap:

Streamflow above Milner was 74% of average, in spite of mid to upper 90s percent of normal precipitation.

Save the Dates:

UI Extension Pesticide Recertification Fall Webinar Series. Click [here](#) to enroll

October 20, 2022—Noon (MT): Cultivating Healthy Plants Webinar series presents "Plant Pathology: Predictive Diagnostics for Plant Diseases" by Dr. James Woodhall. [Click here to register](#)
Pesticide Applicator credit available

January 17, 2023—Idaho Seed Seminar (presented by Idaho Crop Improvement Association)
Call ICIA (Idaho Falls office) at 208-522-9198 to pre-register

January 18-19, 2023—Idaho Potato Conference
More information forthcoming
[here](#)



Without the cool spring, late snow melt, and heavy rain in June there would have been much worse shortages and the storage system would have ended up very near empty.

Cold spring temperatures this year were normal for the 1980s.

The accumulated Growing Degree Days was below average until August. (Probably why potato yields were down.) July through September was record warm, resulting in continued irrigation demand, however total irrigation was down from last year.

Current Status:

Upper Snake Reservoirs hold 484,000 acre feet and are 12% full, which is about 33% of normal and a little less than last year.

Jackson and Palisades Reservoirs hold more water than last year, while American Falls has considerably less.

Soil conditions are dryer than last year across East Idaho.

Last year at this time we had a big snow storm, which ended irrigation needs, compared to warm and dry today.

Near Term Outlook:

Most of October is expected to be warmer than normal. Moisture looks increasingly likely towards the end of the month.

Magic Valley canals will curtail irrigation by the end of the week and American Falls will start to fill.

Henry's Fork reservoirs are slowly filling. Island Park Reservoir should be at low fall flow by next week.

Jackson is currently at low winter flow level. Palisades is still releasing 4,400 cfs to meet irrigation demands. That will decline to winter flows by November 1.

The IWRB will start recharge in the Magic Valley next week with 425 cfs released from Minidoka for power generation and 75 cfs of reach gains.

Putting Current Situation in Perspective:

There was far less water carried over in 2004 when reservoirs held 190,000 acre feet less than today.

In 2002 the natural flow past Milner was 940 cfs lower than now.

It is common to have droughts in East Idaho last for four or five years.

Winter Outlook:

This winter the La Nina is predicted to continue for only the third, third year since 1950. Normally our best snow packs come from La Nina winters, however that obviously didn't happen in 2021 or 2022. There are other cycles that enter into this.

In the previous third year La Ninas, one was very dry and one was very wet, so there is no established trend.

Still, the season outlook is for above average precipitation at this point.

It would take from 110 to 115% normal snowpack to fill the reservoirs next spring."



Keith Esplin is an agricultural and water association manager with over 40 years' experience in the potato, grain, and related industries. He is currently Executive Director of the Eastern Idaho Water Rights Coalition and Eastern Snake Plain Aquifer Recharge.

Input Costs: Global and National Overview

By: Xiaoli Etienne, Associate Professor and Idaho Wheat Commission Endowed Chair in Commodity Risk Management, University of Idaho

Input costs play a significant role in determining producers' profits. Since the beginning of 2022, some key agricultural inputs, fertilizer and fuel in particular, have experienced substantial volatility. Projections from the U.S. Department of Agriculture (USDA) show that the overall cost of production to increase by at least 15% for key agricultural commodities in 2022 but will decrease slightly in 2023 (USDA-ERS, 2022). In this short note, we provide an overview of changes in input costs from a global and national perspective.

Background

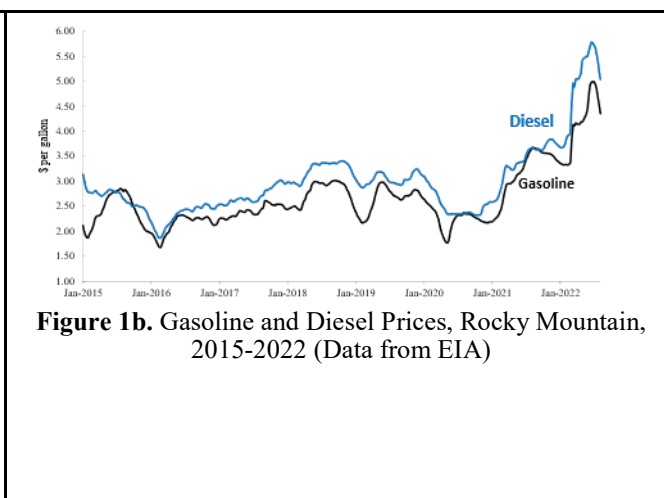
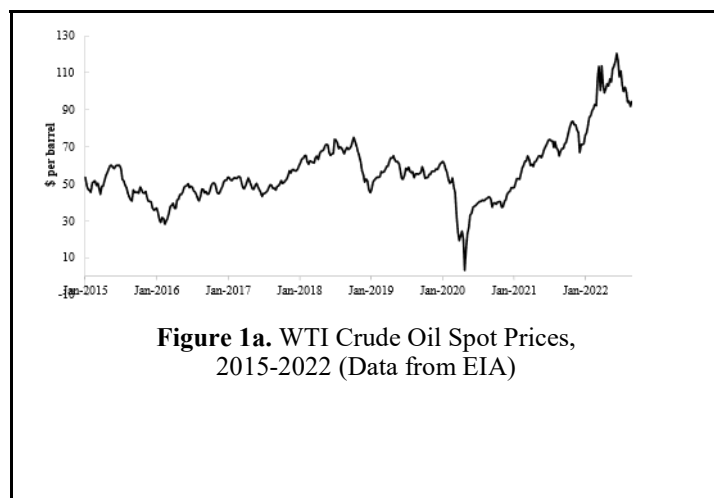
Four events are critical in driving the volatility currently experienced by the agricultural input market. The first is Russia's invasion of Ukraine, which affected the exports of key agricultural commodities (e.g., corn and wheat) and disrupted the energy and fertilizer supply from the two countries. The resulting shortage of fuel and fertilizer has sent the prices of these commodities to record-high levels. Secondly, the rampant inflation in the U.S. posed further upward pressures on agricultural inputs. Efforts by the Federal Reserve to combat inflation, i.e., increasing interest rates to lower demand, greatly increased the cost of lending for agricultural producers.

The third is the resurgence of Covid-19 that continues to disrupt the supply chain. Many manufacturers source a high share of parts and materials from countries experiencing long delays or large bottlenecks due to the pandemic. These firms, including farm equipment producers, will be vulnerable to domestic and overseas supply chain disruptions. Finally, there has been much discussion about a possible worldwide economic recession in the near future. The looming economic outlook contributed to the decline in input prices since the second half of 2022.

Fuel prices rose to highest levels since 2008

Russia is a major producer of oil and natural gas, accounting for 12% and 18% of the global supply of the two commodities, respectively (IEA, 2022). Although the energy sector was not directly targeted when the international sanction on Russia began after the war, some companies tried to avoid Russian oil while some financial institutions refused to finance Russia-related transactions due to political pressure. Prices of WTI crude oil in the U.S. settled above \$120/barrel in March 2022, the highest price since the 2008 financial crisis (see Figure 1a). Refined products, including diesel and gasoline, experienced similar volatility (see Figure 1b), with the former rising to over \$4/gallon and the latter to \$5/gallon in March 2022.

The price of natural gas, the main source of electricity production in the U.S., rose to over \$8/MMBtu in May 2022, almost doubling the price before the war. Projections from the Energy Information Administration (EIA, 2022) show that residential electricity prices will increase by 6.1% in 2022, partly due to higher natural gas prices. Agricultural producers likely experience a similar level of increase in electricity prices.



Fertilizer prices suffer from skyrocketing volatility

Price increases are more evident in the fertilizer market (Figure 2). Even before the war, fertilizer prices were trending upwards due to supply chain disruptions. The war has further exacerbated fertilizer shortages. Globally, Russia ranks 4th and 5th in nitrogen and phosphorus production, respectively, and Russia and Belarus (Russia's close ally) produce about one-third of the world's potassium supply (USDA-FAS, 2022). The sanctions on Russia and Belarus have greatly reduced fertilizer availability in the global market.

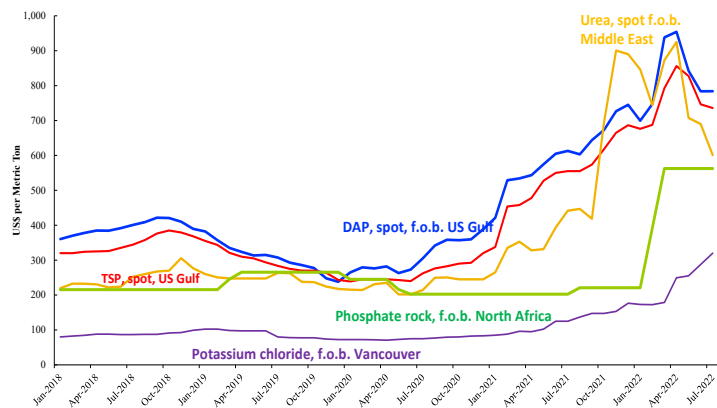


Figure 2. Prices of Various Types of Fertilizers, 2018-2022 (Data from the World Bank)

Meanwhile, China (another major fertilizer producer) has imposed fertilizer export restrictions since July 2021. The fertilizer supply is further affected as many countries limit nitrogen fertilizer production due to high natural gas prices. The perfect storm of events led to a dramatic run-up in fertilizer prices in the first half of

2022. Since mid-2022, fertilizer prices have been trending downwards due to projections of lower demand. However, these price levels are still considerably higher than the pre-pandemic levels.

Heightened inflation and rise in lending rate

Inflation has risen to levels never seen since the 1990s. Between 2000 and 2020, the CPI increased by an average of 2% per year, a level considered ideal by many economists for healthy economic growth. However, the 12-month CPI rose to 7.5% in January 2022; by June 2022, it surpassed 9%. Like consumers, agricultural producers experienced similar inflation-related increases in a broad range of agricultural inputs. The input to industry price index, recently developed by the BLS, shows that the input price inflation for the agricultural sector between September 2021 and August 2022 was over 13% in August 2022 (BLS, 2022).

To fight inflation and get price growth under control, the Federal Reserve gradually increased the interest rate this year. Higher interest rates raise the cost of borrowing money, posing additional upward pressure on input prices for the agricultural sector that heavily depends on borrowed capital. A survey by the Federal Reserve Bank in Kansas shows that the interest rates for all types of farm loans went up in the second quarter of 2022 (FRB-KC, 2022). The largest increase occurred for farm machinery and equipment loans, with the rate averaging around 5%, close to the average level in 2015-19. Despite the modest increase, interest rates for farm loans remained lower than the historical average.

Summary

Significant changes have occurred to the input markets. Although commodity prices are high in 2022, net farm income may not see a similar increase due to the heightened input prices. In June 2022, the USDA Economic Research Service released its latest cost of production forecasts for key crops (Table 1). The biggest changes in inputs are the items discussed in this note: fuel, fertilizer, interest payments, and capital recovery of machinery and equipment. In general, the operating and total production costs for the three commodities are projected to increase by about 30% and 15% in 2022, respectively. With the projected lower economic growth in 2023, the operating costs of the three crops are projected to decline by between 3-5% in 2023, mainly because of lower fertilizer, fuel, and electricity prices. A slight decrease is also likely for the total cost of production.

References:

- BLS, 2022, A New BLS Satellite Series: Inputs to Industry Price Indexes. Available at <https://www.bls.gov/ppi/input-indexes/>
- EIA, 2022, Short-Term Energy Outlook, August 2022. Available at <https://www.eia.gov/outlooks/steo/>
- FRB-KC, 2022, Farm Lending and Interest Rates Tick Up. Available at <https://www.kansascityfed.org/agriculture/agfinance-updates/Farm-Lending-and-Interest-Rates-Tick-Up/>
- IEA, 2022, Oil Market Report-February 2022. Available at <https://www.iea.org/reports/oil-market-report-february-2022>
- USDA-ERS, 2022, Cost-of-production forecasts for U.S. major field crops, 2022F-2023F. Available at https://www.ers.usda.gov/webdocs/DataFiles/47913/cop_forecast.xlsx?v=7577.3
- USDA-FAS, 2022, Impacts and Repercussions of Price Increases on the Global Fertilizer Market. Available at <https://www.fas.usda.gov/data/impacts-and-repercussions-price-increases-global-fertilizer-market>

Table 1. Projected cost of production for corn, wheat, and barley, U.S. average

Item	Corn			Wheat			Barley		
	2021	2022 fore- cast	2023 fore- cast	2021	2022 fore- cast	2023 forecast	2021	2022 fore- cast	2023 forecast
-----Dollars per planted acre-----									
Operating costs									
Seed	91.42	90.51	90.81	14.51	14.36	14.41	19.60	19.40	19.47
Fertilizer ²	116.57	189.00	180.50	43.63	70.74	67.56	47.54	77.08	73.61
Chemicals	31.48	36.41	37.44	15.14	17.51	18.01	20.24	23.41	24.07
Custom operations ³	23.49	24.71	25.44	14.33	15.07	15.52	6.19	6.51	6.70
Fuel, lube, and electricity	26.96	36.11	29.71	10.55	14.13	11.63	13.25	17.74	14.60
Repairs	37.96	40.95	40.04	27.51	29.68	29.02	30.71	33.13	32.40
Other variable expenses	0.28	0.29	0.30	0.80	0.84	0.87	2.60	2.73	2.82
Interest on operating capital	0.1	2.93	6.06	0.04	1.14	2.36	0.04	1.26	2.61
Total, operating costs	328.26	420.90	410.31	126.51	163.47	159.37	140.17	181.27	176.28
Allocated overhead									
Hired labor	5.64	5.67	5.84	4.43	4.45	4.59	4.55	4.57	4.71
Opportunity cost of unpaid labor	32.34	32.51	33.50	18.90	19.00	19.58	17.40	17.49	18.03
Capital recovery of machinery and equipment	134.64	152.55	148.15	103.33	117.08	113.70	114.19	129.38	125.65
Opportunity cost of land	163.41	165.25	159.11	62.10	62.80	60.46	78.31	79.19	76.25
Taxes and insurance	13.53	14.04	14.19	7.00	7.26	7.34	12.13	12.59	12.73
General farm overhead	20.91	22.56	22.06	9.99	10.78	10.54	20.31	21.91	21.43
Total, allocated costs	370.47	392.57	382.86	205.75	221.37	216.22	246.89	265.13	258.79
Total, costs listed	698.73	813.47	793.18	332.26	384.84	375.58	387.06	446.40	435.07

Notes: Table reproduced from USDA ERS Cost-of-production forecasts for U.S. major field crops, 2022F-2023F. Available at https://www.ers.usda.gov/webdocs/DataFiles/47913/cop_forecast.xlsx?v=7577.3

Input Costs: Idaho Overview

By: Patrick Hatzenbuehler, Assistant Professor and Extension Specialist – Crop Economics, University of Idaho

The prices for many farm inputs, such as fertilizer, are determined more so by conditions on global or national rather than local markets. However, the industrial organization (i.e., businesses that sell the products) and geographical characteristics (e.g., infrastructure, presence of irrigation) can be more important factors for determining the prices of other factors such as farm labor (wages) and irrigation water assessments and can lead to variation in the nationally traded inputs across different locations. Thus, in this section of the report, current prices for several Idaho crop inputs are presented and discussed.

Background: U.I. Extension input price data gathering

Just like for everything, change continues for the U.I. Extension Farm Management faculty. Three faculty who were engaged in gathering farm input price data and developing farm enterprise budgets left U.I. Extension between 2021 and early 2022. Given this substantial loss in experience, expertise, and time to devote to these activities, a pilot program was initiated in February 2022 in which two undergraduate students at the U.I. Moscow campus, Tyler Hand and Sarah Reisenauer, were hired to receive training in and engage in data gathering of farm input price under the advising of two U.I. faculty (Patrick Hatzenbuehler and Norm Ruhoff). The training consisted of describing the main components of enterprise budgets (e.g., revenue, cost categories), data types (e.g., primary, or secondary), identifying main data sources, and developing sampling strategies. The two main outputs for this pilot project so far are the “Idaho Crop Input Price Summary for 2022”, which was last updated in 2014, and sugarbeet enterprise budgets for 2022, both of which are scheduled for release in fall 2022.

The data presented today were gathered by Tyler and Sarah. Price data for herbicides, sticker/spreaders, fungicides, fumigants, insecticides/nematicides, and seeds are still being gathered. The data reported here are for fertilizer, fuel, interest rates, irrigation power, labor, and surface water assessments. We are grateful to the sources who have contributed advice and data!

Irrigation and labor

These two cost components are reported first because they comprise a relatively high share of total costs of crop enterprises on a per acre basis. Table 1 shows data for irrigation power for 2021 and 2022 for a variety of different irrigation systems. Irrigation power costs increased from 2021 to 2022 for every irrigation system, and the year-to-year increase was about 9% for all.

Table 1. Irrigation power costs for 2021 and 2022. Note: All are for 0 ft. lift; units are \$/acre-inch. Source: Idaho Power.

	2021	2022
Center Pivot w/ corner system	\$2.53	\$2.76
Center Pivot w/ endgun	\$1.68	\$1.84
Center pivot w/o endgun	\$1.58	\$1.73
Low pressure center pivot w/o endgun	\$0.92	\$1.01
Wheel line	\$1.52	\$1.66

Unlike the irrigation power costs for which similar values are observed throughout the state, surface water assessments vary greatly across regions, and there were substantial differences in the year-to-year changes between 2021 and 2022 in different regions. The Southcentral region retained the highest surface water assessment fees across the regions, but the largest increase between 2021 and 2022 was for the East (south) counties and the smallest was for the East (north) counties.

Table 2. Surface water assessment fees for 2021 and 2022 by Idaho region.

Idaho region	2021	2022	% change
Southwest	\$59.75	\$64.92	+9%
Southcentral	\$72.67	\$76.00	+5%
East (north)	\$12.42	\$12.50	+1%
East (south)	\$53.00	\$60.50	+14%

Note: all are in \$/acre. East (north) includes Bonneville, Jefferson, and Madison counties. East (south) includes Bannock, Bingham, and Power counties.

Sources: Various irrigation districts.

Labor can be one of the most substantial cost segments for a farm business, especially for those that have labor-intensive production activities. Table 3 includes data on wages for several types of farm positions for 2021 and 2022. The data show that wages increased between 2021 and 2022 for all positions, and the increase was about 10% for all.

Table 3. Wages for various types of farm positions.

	2021	2022
General farm labor (Seasonal)	\$14.29	\$15.76
Truck drivers (harvest)	\$18.94	\$20.88
Irrigation labor	\$17.29	\$19.06
Equipment operator	\$16.19	\$17.85

Note: Base wages; units are \$/hour.

Source: Idaho Department of Labor.

Fertilizer, fuel, and interest rates

These three cost components have been discussed widely in the agricultural and general media in recent months due to their prices increasing substantially on global or national markets as discussed by Xiaoli Etienne in the other part of this report. Table 4 includes fertilizer prices for dry Nitrogen, Phosphorous, and Potash for Southern Idaho for 2021 and 2022 as of April 2022. Prices for all types of fertilizer increase substantially between 2021 and 2022, with the largest increase for Potash. Phosphorus became the most expensive fertilizer on a \$/lb. basis in 2022.

Table 4. Fertilizer prices for Southern Idaho for 2021 and 2022.

	2021	2022	% change
Dry Nitrogen	\$0.42	\$0.50	+19%
Dry Phosphorous	\$0.41	\$0.53	+30%
Dry Potash	\$0.31	\$0.45	+45%

Note: Data gathered in April 2022; units are \$/lb.

Like fertilizer prices, fuel prices have also increased substantially from 2021 to 2022. According to AAA Gas Prices data, the I.D. statewide diesel price increased from \$3.84/gallon in August 2021 to \$5.22/gallon in August 2022, which is a 36% increase. This substantial increase in diesel prices is particularly impactful for energy-intensive sectors and operations.

The U.S. Federal Reserve started to raise interest rates from a base of 0% in March 2022 and has continued to raise rates at each of its policy meetings through July 2022. These interest rate increases are expected to eventually lead to increases in operating (less than 12 months), intermediate term (3 – 7 year), and long term (15 – 30 year) farm loans. The U.S. Federal Reserve target interest rate as of August 2022 is 2.25 – 2.5%, which is the same target range as observed in March 2019. To illustrate the potential impact of the return to higher interest rates on operating loans, one quote for an operating loan for a prominent lender in April 2022, when the U.S. Federal Reserve target interest rate was between 0.25 – 0.5%, was 3.25%, while the one used in most enterprise budgets for 2019 was 7%. While many factors such as business size and borrowing history can influence a business' operating loan rates, these differences are indicative that average interest expenses are likely much higher as of August 2022 than they were earlier in 2022 and in 2021.

Summary

This overview of a select set of Idaho crop input prices for 2022 showed that all analyzed cost segments observed increases between 2021 and 2022. Some of the cost segments such as fertilizer and fuel had the most substantial increases. Our forthcoming more comprehensive "Idaho Crop Input Price Summary for 2022", expected for release in the fall 2022, will have prices on more farm input types and for more regions. It will be interesting to see if the trends observed for the analyzed costs segments for this report are like those for which data gathering remains ongoing.

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