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RightRisk™

RightRisk News

No-Pause Button: Why Farming Can't Slow Down Like a Factory

Agriculture is one of the few major production sectors where the factory floor is largely exposed to weather, pests, disease, markets, and biological timing. Farmers and ranchers cannot always slow down, shut down, or redirect production when conditions change. A crop has to be planted before the weather is known. Livestock must be cared for regardless of market conditions. Labor, machinery, fuel, seed, feed, fertilizer, and management time are often committed long before the final value of production is known.

That is one reason agriculture requires a different kind of risk management discussion than many other industries. Producers are not just managing production. They are managing exposure to uncertainty after many of the major production decisions have already been made. One useful way to see this risk is through labor productivity.

What labor productivity measures

Labor productivity measures how efficiently labor hours are converted into output. In simple terms, it is the value of output produced divided by the hours of labor used to produce it.

$$Labor\ Productivity = \frac{Real\ Output}{Hours\ Worked}$$

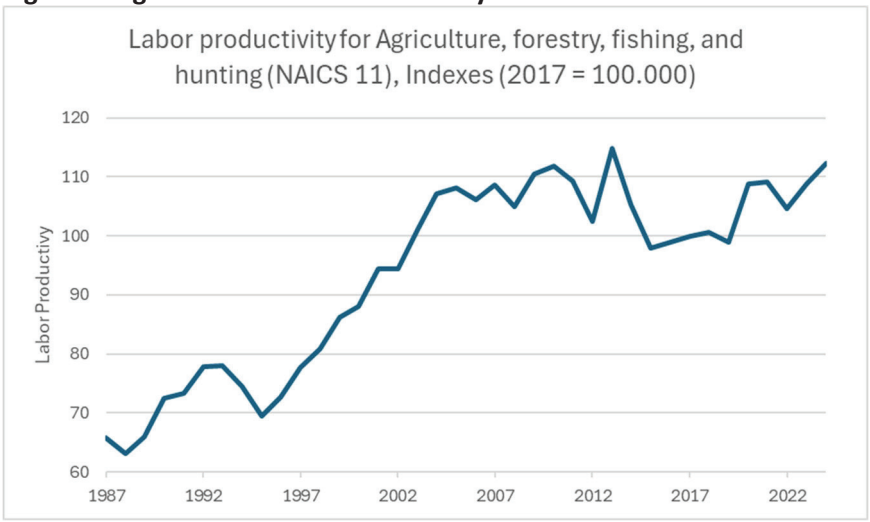
The U.S. Bureau of Labor Statistics tracks labor productivity across industries. The sector measure used here is NAICS 11, Agriculture, Forestry, Fishing and Hunting. Although this measure is broader than farm production alone, it provides a useful indicator of productivity variation in agriculture and related natural-resource industries.

For agriculture, real output includes the inflation-adjusted value of farm production, including products sold, changes in inventories, and farm products consumed by farm households. Labor hours include hired workers, self-employed farmers, and unpaid family labor.

Over the long run, U.S. agriculture has made tremendous gains in labor productivity. The USDA Economic Research Service estimates that from 1948 to 2017, agricultural output nearly tripled while total farm labor hours declined by more than 80%. The result was a 17-fold increase in agricultural output per hour worked.

Those long-term gains matter. They reflect better equipment, improved genetics, improved production practices, stronger management, and more capital-intensive farming systems. The concern is not that agriculture has become more productive. The concern is that year-to-year labor productivity in agriculture can swing sharply around that long-term trend, and those swings carry real financial consequences.

Figure 1: Agricultural Labor Productivity 1987-2024.



Source: U.S. Bureau of Labor Statistics

The farm versus the factory

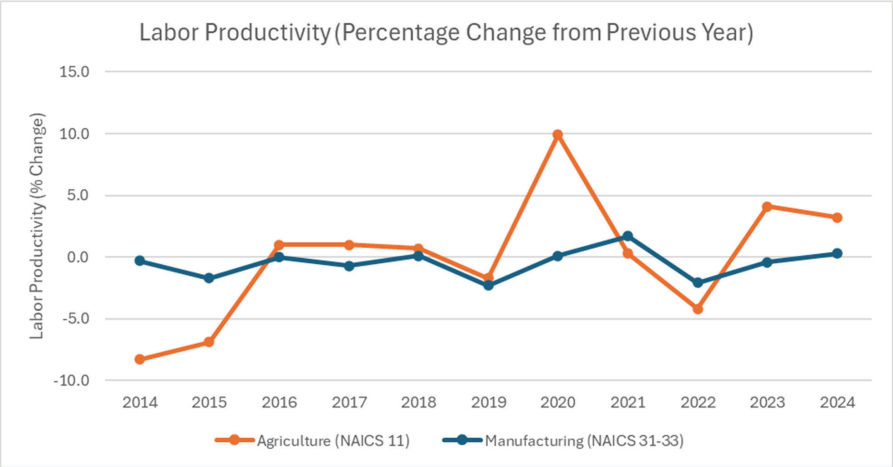
Manufacturing provides a useful comparison. A factory producing car parts, appliances, or manufactured goods may face serious risks, but production is generally more adjustable than in agriculture. If demand falls, a plant may slow the line. If a machine breaks, production can be rescheduled. If inventory builds, output can be temporarily reduced.

Agricultural producers usually do not have that same pause button. Much of the variable expense in crop and livestock production is committed before the final

How Much Risk is Right for You?

value of production is known. Seed, fertilizer, chemicals, fuel, machinery use, feed, livestock care, and management time may already be invested before weather, disease, prices, or performance outcomes are clear. Labor is especially difficult to adjust because owner-operator labor is often a full-time commitment to the business. Unlike a factory that may reduce shifts or adjust its labor force as conditions change, a farm or ranch often carries labor through the production cycle even when the return from that labor is reduced. That is why labor productivity is a useful measure for comparing agricultural risk with other sectors.

Figure 2: Agricultural versus Manufacturing Labor Productivity Variation 2014-2024.



Source: U.S. Bureau of Labor Statistics.

This difference shows up clearly in the data. From 2014 to 2024, the average absolute year-to-year change in agricultural labor productivity was nearly 4%, compared with less than 1% for manufacturing. During that period, agriculture ranged from an 8.3% decline to a 9.9% increase in a single year. Manufacturing ranged from a 2.3% decline to a 1.7% increase. The standard deviation for agriculture was 4.9, compared with 1.1 for manufacturing.

In practical terms, agricultural labor productivity was at least four times more variable than manufacturing labor productivity over this period.

Risk Management in Agriculture

Agricultural labor productivity did not decline every year from 2014-2024, but when declines occurred, they were often larger than anything observed in manufacturing during the same period. That downside exposure is what matters for risk management.

That does not mean labor productivity alone determines profit. Profit also depends on prices, input costs, debt service, interest rates, government payments, marketing decisions, machinery costs, family living withdrawals, and many other factors. But labor productivity volatility is a useful warning signal. It shows that agricultural producers regularly face large swings in the value of output relative to labor commitments that cannot easily be adjusted once the production cycle begins.

When drought, pests, disease, severe weather, or market shocks reduce output value, producers cannot recover the labor and capital already committed. That is the risk-management problem.

Efficiency gains can amplify risk, not just reduce it

Modern agriculture has become more capital intensive and less labor intensive. Larger machinery, improved technology, and more specialized systems allow producers to farm more acres, handle more livestock, and produce more output per hour of labor. That efficiency is valuable, but it also changes the risk profile of the operation in a way that is easy to overlook.

When fewer labor hours are used to produce more output, labor productivity can look very strong in normal or good years. But the same system may also carry higher fixed costs, greater machinery investment, more debt exposure, and more dependence on timely completion of field or livestock operations.

A Farm Example

Consider a practical example. Suppose two operations each farm 1,000 acres of dryland wheat and both experience a 25% yield loss due to drought. Operation A uses 1,000 labor hours to get the crop in and out. Operation B, with newer equipment and a higher automation level, uses 500 labor hours to accomplish the same work.

If labor hours are fixed, both operations experience a 25% decline in output per labor hour. Operation B may still show higher labor productivity because it uses fewer hours. However, the dollar loss in output is concentrated across fewer labor hours, and the equipment that reduced labor hours may also bring higher fixed costs, depreciation, repairs, insurance, and debt obligations. The risk is not only the change in labor productivity. The risk is the combination of lower output value and higher financial commitments that must be covered in both good years and bad.

This does not mean producers should avoid efficiency investments. Efficiency is often essential to staying competitive. But efficiency should be evaluated alongside risk, not instead of it. A machinery purchase, expansion decision, custom-hire arrangement, or enterprise change may reduce labor per unit of output while increasing fixed costs, debt obligations, or dependence on a narrow production window.

The better question is not simply whether a change improves average efficiency. The better question is whether it

improves the operation's ability to survive a bad year.

Labor risk is not the same on every farm

Labor productivity risk does not look the same across all operations. The table below is illustrative. Actual labor exposure depends on location, scale, labor source, technology, water access, production system, and marketing arrangement.

Enterprise Type	Labor Intensity	Key Labor Commitment Point	Primary Productivity Risk
Dryland grain	Low to medium	Planting through harvest window	Drought, hail, delayed harvest
Irrigated row crops	Medium	Season-long irrigation and crop management	Water availability, input cost spikes
Cow-calf / stocker	Medium	Year-round animal care and seasonal forage use	Drought, forage shortages, price decline
Dairy	High	Daily, non-negotiable animal care	Feed cost, milk price, labor turnover
Specialty / vegetable	Very high	Seasonal harvest labor	Labor availability, weather at harvest
Custom grazing	Low to medium	Stocking decisions and grazing contracts	Forage conditions, contract terms

This matters because there is no single labor productivity risk strategy that fits every operation. A vegetable grower managing seasonal hired crews faces fundamentally different exposure than a dryland grain farmer relying primarily on family labor during a few critical production windows. A dairy's labor commitments are daily and non-negotiable in a way that differs from many crop operations. A cow-calf operation may have more flexibility in some areas, but it still faces daily animal-care responsibilities and forage-related risk.

The common point is this: producers should understand where labor, capital, output, and uncertainty intersect in their own operation, not in the average operation described in an extension publication.

The family farm impact

Labor productivity volatility is not just a data issue. It affects families. Putting in long hours only to see little financial return takes a toll on stress levels, family relationships, and long-term business confidence. A producer may do everything right from a management standpoint and still face a poor result because weather, disease, prices, or policy conditions moved against the operation.

That is one reason risk management tools exist. Crop insurance, livestock insurance, diversification, financial reserves, off-farm income, and marketing tools do not eliminate uncertainty. They help producers survive the years when labor and capital have already been committed but output or price falls short.

Managing the risk

Producers do not manage labor productivity directly in the same way they manage stocking rates, seed selection, or marketing plans. But labor productivity can help identify where an operation is exposed.

A few practical questions can help:

- How much labor is committed before output or price is known?
- Which enterprises require labor even when expected returns decline?
- How much of the family's total income depends on farm or ranch output?
- Which enterprises are most vulnerable to drought, disease, pests, weather delays, or market shocks?
- Which risks are covered by insurance, marketing tools, reserves, off-farm income, or diversification?
- What happens to the operation if output falls but labor requirements do not?

Insurance is one of the major tools available. Crop insurance, livestock insurance, Pasture, Rangeland, Forage insurance, and other risk management products may help protect revenue or output value when adverse conditions occur, depending on the enterprise and location. These tools do not guarantee profit, but they can limit the downside when committed labor and capital fail to produce the expected return.

Diversification can reduce dependence on a single enterprise, crop, market, or production season. However, diversification is not a blanket solution. Drought, high feed costs, labor shortages, interest rate increases, and broad market declines can affect multiple enterprises simultaneously. Diversification should be stress-tested, not just evaluated against average years.

Off-farm income helps many farm and ranch families stabilize household cash flow during low-return years, reducing pressure on the farm business for debt service and family living needs.

Machinery and custom-hire decisions deserve careful analysis. Machinery can improve efficiency and reduce labor bottlenecks. It can also increase fixed costs, depreciation, repairs, and debt exposure. The right question is not just whether a machine reduces labor per acre. It is also whether the machine and the payment that comes with it improve or weaken the operation's ability to absorb a bad year.

Labor management matters throughout. Clear job descriptions, training, communication, and employee retention improve how effectively labor hours contribute to the business. Even excellent employees, however, cannot eliminate weather, price, disease, or policy risk. Labor management is one piece of a broader strategy, not a substitute for it.

Using RightRisk tools to make better decisions

RightRisk provides several tools that can help producers evaluate these questions before committing money, labor, or machinery. The *Enterprise Risk Analyzer* can help compare different parts of the operation and evaluate which enterprises contribute most to expected returns and overall risk. This is useful when deciding whether an enterprise stabilizes the business or adds exposure.

The *Risk Scenario Planning* tool helps evaluate a proposed change under uncertainty. Instead of relying on a single estimate for price, yield, cost, or labor needs, producers can enter a range of possible values and evaluate how results change across many possible outcomes. This is especially useful when considering expansion, new technology, or a shift in production practices.

The *Machine Risk Calculator* helps evaluate machinery ownership versus custom-hire decisions. A machinery investment may improve timeliness and reduce labor pressure. It also adds fixed costs that must be paid in good years and bad. Running the numbers before committing is far better than discovering the problem after the fact.

These tools are useful precisely because labor productivity risk is rarely isolated. It is tied to prices, yields, costs, machinery, debt load, labor availability, and family goals. A tool-based approach helps producers move beyond average expectations and think more carefully about the full range of possible outcomes.

A note on policy

Farm policy has long recognized that agriculture faces risks different from those in most other sectors. Federal crop insurance, livestock risk tools, disaster assistance, and other programs reflect the reality that producers commit labor and capital before production and price outcomes are known.

At the same time, not every labor productivity risk can or should be addressed through broad policy intervention. Much of it must be managed at the farm level. One policy question worth watching is whether current tools are sufficient to help family farms smooth income volatility across bad years, or whether additional reserve, savings, or income-smoothing mechanisms deserve consideration. That is a conversation worth having before the next farm bill deadline arrives.

Conclusion: plan before the bad year arrives

Labor productivity is more than an efficiency measure. In agriculture, it is also a signal of risk. Long-term productivity gains have helped U.S. agriculture produce much more output with far fewer labor hours. But year-to-year swings in labor productivity remain much larger in agriculture than in more stable production sectors like manufacturing. Those swings reflect agriculture's exposure to weather, biology, disease, pests, market shocks, and the limited ability to adjust labor once production commitments are made.

Farmers and ranchers cannot eliminate this risk. But they can manage it. Insurance, diversification, off-farm income, careful machinery decisions, strong labor management, financial reserves, and RightRisk decision tools can all help producers prepare for the unexpected. The goal is not to predict every bad year. The goal is to build an operation that can survive one.

Understanding labor productivity is a step in that direction. It helps every producer ask a practical question: if output falls, prices weaken, or labor needs rise unexpectedly, how well can this business absorb the shock? That is a question worth answering before the unexpected happens, not after.

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