In our old wooden red barn, a set of "trees" hang on the wall. They're wooden bars with metal rings and fasteners at the ends. Farmers once used these when hooking up a team of horses to pull a farm implement, wagon or trailer. And I have no clue how to use these; I have never farmed using horse nor mule.

I remember my father talking about farming with animals. He was a poor, young farmer in 1946 and had no choice; he couldn't afford the new technology of a tractor. Little did my father know that year also marked the transformation of American agriculture: the moment tractors overtook horses on the farm. Innovation trumps tradition.

Earlier in the 1900s, Henry Ford had first introduced the Fordson, a modern tractor with a smaller gas-powered engine. The Model F was farmer friendly, if the average farmer was willing to tolerate the unbearable engine heat and the occasional motor catching on fire.

Imagine millions of farmers, shaking their heads and saying, "Ain't gonna work." They then returned to their farm with Jake or Betty, their loyal and steady team of horses or mules.

They could not foresee the changes coming. They didn't understand Ford's arrogant yet visionary comment: Ask farmers what they want and they would have said a faster horse.

Driven by efficiency, gradually the Fordson was improved. It still required new inputs of gas and oil and used resources of steel and later rubber, but it could outperform the poor old horse.

The tractor triggered a massive change in farm size. In 1900, farmers typically worked about 100 acres; by 1960, it was 300 acres (and today it's more than 400 acres). Some claim the push for productivity forced farmers to keep expanding in a never-ending race.

Productivity in agriculture has resulted in cheaper and cheaper food. The efficiencies brought by the tractor, as well as other innovations and equipment, made food more available than ever before. According to the Bureau of Labor Statistics, the percentage of our annual income spent on food has continually plummeted. In 1900 when horses ruled our farmlands, Americans spent 43% of their income on food. By 1950, it had dropped to 30%, and today, it's less than 9%. Tractors rule, horses drool.

American farms changed in another significant way: Human labor was less needed and the farm population dramatically shifted. In 1900, 41% of America claimed to be farmers and 60% of Americans lived in rural areas. By 1960 (as tractors dominated agriculture), the number of farmers had collapsed to only 8% and rural communities shrank to 30%. Today, fewer than 2% acknowledge they are farmers and rural America is about 20% of the population.
But were millions of workers displaced or freed?

Other than periods of the Great Depression and images from Grapes of Wrath, this migration off the farm did not necessarily include economic refugees who were poor, out of work and fleeing the terror of the tractors that pushed humans off the land. For many, it was an escape from the hard, physical work of farming.

Industrial America grew at precisely the same moment in our nation's history, absorbing this labor force. Commerce benefitted from a new set of skilled hands, launching the rise of the urban middle class. The tractor, far from being a mechanical demon, was seen as a savior. It freed millions from the torture of farm labor and isolated rural life.

The American tractor became the picture-perfect image of capitalism's creative destruction. In the name of productivity and efficiency, innovation destroys old systems – they shoot horses, don't they?

Progress? Not if you were a horse. And not without issues.

What price are we paying for cheap food? Major medical problems today are associated with the inexpensive processed food that Americans stuff themselves with. Indirectly, can obesity and diabetes somehow be connected with the tractor and the rise of mass-produced commodities in search of a mouth to feed? Or is this all a moot point, long after the horse left the barn.

And are bigger farms necessarily always better? Some will claim that environmental bill has yet to be paid by large scale agriculture. In our Valley, some communities cannot drink water from their wells because excess nitrates — often from agriculture — have polluted groundwater supplies.

Ironically, the loss of people on the farm also meant a loss of voters supporting agricultural policy. We forget that tractors also displaced rural political clout. Politically, the farm vote really doesn't count any more.

In the last election, the failure of the controversial Proposition 37 about labeling GMOs (Generically Modified Organisms) was defeated by the urban vote. More and more, policy decisions for agriculture are determined by "city folks." It's not about politics, it's geography.

I have a number of tractors on our farm. They don't require daily feeding, can work for hours and hours pulling with ease heavy equipment through my fields. Daily, my body thanks the arrival of tractors.

But they aren't alive and I find little comfort in their cold metal and the smell of diesel. So when I look at the horse tack hanging in my old barn, I also see more than the rise of tractor power. I also can't help but see the consequences of innovation.

*Award-winning author and organic farmer David Mas Masumoto of Del Rey writes about the San Joaquin Valley and its people.*