

The Squeeze on Farmers

The conversion of farmland into housing developments is a prominent topic in the growth and sprawl debate. Farmers are under tremendous economic pressure and, appropriately, their plight is also a matter of concern at the national level. The pressure on them is so great that many farmers are going out of business, selling out to larger farms or developers. This section describes why this is happening.

The issues were addressed in a story aired on NPR on 3/20/01.¹⁰⁹ In 1996 the Republican Congress passed the “Freedom to Farm” act. Its approach was to relieve economic pressure on farmers by allowing them to plant as much as they want, ending farm subsidies and decades of government interference, such as crop quotas and payments to take land out of production. Allison Aubrey, of NPR, reported [<http://search.npr.org/cf/cmnpd01fm.cfm?PrgDate=03/20/2001&PrgID=3>] the aim of the “Freedom to Farm” act was to save \$3 billion by 2001. But the opposite has happened and new farm subsidies are getting even bigger. She said, “This year taxpayers will spend \$20 billion to support farmers, much of it in the form of emergency payments.” Though it appeared to work for a few years, the market bottom fell out ... prices tumbling to record lows, presumably because demand from foreign countries dropped.

At the March 20, 2001 National Agriculture Day convention in Washington, DC, farmers were still turning to Washington for subsidies, maintaining that their need for aid is only for the short-term, while they wait for the market to turn up again. But their problem is more intractable than this. In the NPR story, Senator Tom Harkin (D, IA, Senior Democrat on the Agriculture Committee), argues that a laissez-faire approach to farming will not work. He stated, “Agriculture is still not out of the woods yet. I mean, if we don’t have some changes, we’re going to continue to put more billions of dollars into these emergency payments and it’s going to have the odd result that we’re putting more money into agriculture and yet we’re driving more farmers out.”

Aubrey continues that “... the main problem for ... most farmers: they’ve become too efficient. Their farms are bigger than ever and their yields are higher. But there’s nowhere to sell the product.” She continues: “Senator Richard Lugar (R, IN) the Chairman of the Agriculture Committee, and the man who pushed hardest for the 1996 agriculture reform, says the new hands-off approach to farming would be working, if it weren’t for some unforeseen bumps in the road, like an economic crisis half-way around the globe in the late 1990s.” Senator Lugar states, “The Asian countries, who had been dynamic markets, growing by leaps and bounds, came to a terrible recession. And, instead of growing by leaps and bounds, cut about 10% of the effective demand for all of American agriculture. So that was a blow.” Aubry continues, “Not to mention the trade disputes with Europe, Lugar adds. So when he hears about the problems of the pea and lentil producers he’s sympathetic, but he still believes agriculture should be self-supporting and argues, once the pea and lentil guys start relying on government price guarantees, they’ll be hooked.” Then Lugar states his conclusion: “If the most efficient farmers find it possible to make more money all of the time producing more because the safety net insures a profit, there is really no end to a degree of oversupply and low price.” Aubry concludes: “The latest proposal from Democratic lawmakers would increase spending on agriculture by \$100 billion in the coming years, an amount that rivals President Bush’s proposal for defense modernizations. So it’s more, not less, spending on agriculture and each year the tab escalates, Congress, in effect, repeals a little more of the reform it embraced 5 years ago.”

At least one agricultural expert understands what’s going on. Daryll E. Ray, agricultural economist with the Agricultural Policy Analysis Center at the University of Tennessee, testified before the House Committee on Agriculture on 2/14/01.¹¹⁰ His testimony is insightful and worth reading [<http://agriculture.house.gov/hearings/h10214w2.htm>]. He testified:

My analysis suggests that we are dealing with long-term or chronic issues that have shaped agriculture’s response to the current farm bill and to previous farm bills. The farm policy experiment we have been running over the last five years has revealed that the 1996 Farm Bill was based on speculation.

- Speculation that export growth, especially to China, would propel crop agriculture into a new era of farm prosperity.

¹⁰⁹ NPR 3/20/01. “Farmers In D.C. (14.4 | 28.8) -- NPR’s Allison Aubrey reports on a group of mid-western farmers coming to Washington D.C. to lobby for government price supports for their crops. Many farmers opted out of the support in the 1990’s, but now say the decline of Asian markets is forcing them to ask for government help again. (6:55)”

¹¹⁰ Testimony of Daryll E. Ray before the House Committee on Agriculture, February 14, 2001, “Crop Agriculture Faces Long-Term Price and Income Problems,” Daryll E. Ray is agricultural economist with the Agricultural Policy Analysis Center at the University of Tennessee. Italics and underlings are as in his original.

- Speculation that farmers would now respond to market signals, producing less when prices decline and more when prices increase.
- Speculation that domestic and export markets would now expand quantities demanded when prices decline and reduce quantities demanded when prices increase.
- Speculation that the crop markets (notice I say crop markets, with an “s”) will self correct in a reasonable time without politically unacceptable devastation to the sector.

As is generally true, speculation sometimes generates successes, but failures are common. I respectfully submit to you that each of the identified speculated changes in the economic underpinnings of crop agriculture was wrong.

Furthermore, our response to the subsequent downward spiral of crop agriculture suggests that we are in denial. We are in denial that anything long-term is to blame for the devastatingly low prices and low market incomes in crop agriculture. We are more than willing to blame agriculture’s problems on the Asian Crisis, exchange rates, energy prices, or anything else that comes along. Others blame the level of loan rates, emergency payments, crop insurance, etc., etc.

The implication being that: once the—you-name-it-disruption—subsidies or is remedied, agriculture will be just fine. *That is non-sense.* There are *always* disruptions. There are disruptions in agriculture, the auto industry ... every industry. At this stage of the farm policy debate, discussion should not center on this or that disruption, but on the ability of agricultural markets to make adjustments irrespective of the exact nature of the disruption. Other industries self-adjust. Why doesn’t crop agriculture? That is the real question.

This time in history and this stage of the farm bill debate cycle provide the perfect opportunity to make a definitive determination of the how the grain markets work. For the first time in nearly seventy years, markets have been free to reveal the true supply and demand behavior of U.S. crop markets.

I believe that the market experience of the last four years shows that crop agriculture is just as prone today to chronic price and market income problems as it was when farm programs were instituted decades ago. My mission in this testimony is to explain why I believe that is so.

Agriculture’s price and income troubles are quickly understood by considering a) the rate of growth of crop supply compared to crop demand and b) the price responsiveness of supply and demand.

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Total crop acreage (supply) is unresponsive to price declines in short or longer-run.

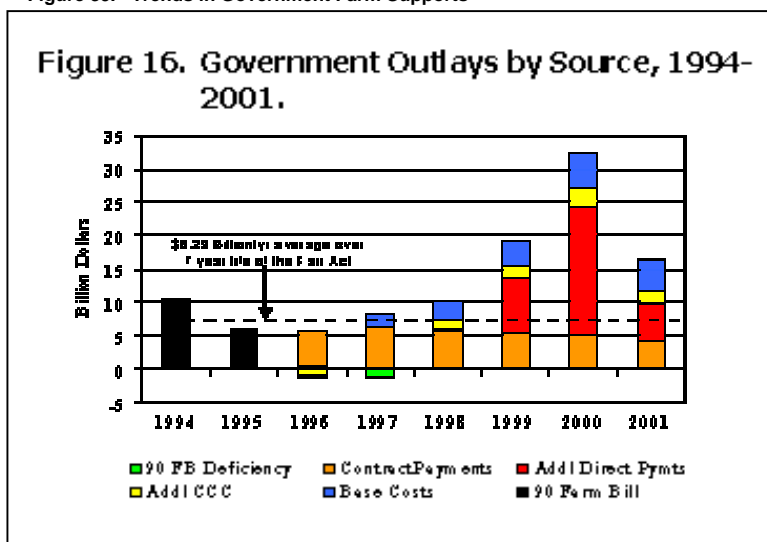
Farmers have no incentive to reduce production as prices decline. From an individual farmer’s standpoint, there is no rational reason for him/her to leave land idle because crop prices have declined (see figure 3, p.6). Each farmer produces too little to affect total supply and therefore price, so any reduction in his output means less revenue.

...

Demand is unresponsive to price changes.

Because it is essential for life—like insulin for a diabetic—price is of little consequence. Food comes first. We will pay whatever is required to obtain it. But once we have enough, will not buy significantly more total food, no matter how far the collective price of food has dropped. Is this true for other products? Of course not. Typically, a price drop greatly expands the quantity demanded of an industry product.

Figure 39. Trends in Government Farm Supports



His chart showing steadily increasing government outlays for farm supports is shown in Figure 39 (his Figure 16).

As Daryll Ray points out, we are prone to look for, and find, proximate causes for the outcomes we observe. An excellent example of this is Senator Lugar’s identification of the “terrible recession” in the Asian countries” as **the cause** of the failures of his “Freedom to Farm” act. But this problem, like other problems discussed in this paper, is more fundamental than an Asian recession. **“A fundamental principle of system dynamics states that the structure of the system gives rise to its behavior.”**¹¹¹

Daryll Ray’s insightful and compelling concluding remarks explain why crop agriculture doesn’t self-adjust.

Agriculture is unique. Much of that uniqueness is rooted in two characteristics: (1) cropland will be used to grow crops and (2) food is essential for life but the quantity needed is finite. These and other supply and demand characteristics virtually assure

¹¹¹ John D. Sterman, *Business Dynamics: Systems Thinking and Modeling for a Complex World*, 2000, Irwin McGraw-Hill, p. 28.

that there will be little change in total crop acreage and little change in the quantity demanded as prices fall, even by 40 percent over a four year period.

Periodically, crop exports will grow for several years at relatively high rates, but usually they do not. Technological advances in crop agriculture, most of which is directly or indirectly possible because of taxpayer support, assures relatively rapid shifts in supply. Under this combination of price unresponsive supply, price unresponsive demand and supply shifting faster than demand, prices and income can be expected to be chronically depressed. This is not a short-run problem.

Left to itself, crop agriculture would continue its downward spiral, bankrupting successive farmers on a given piece of land, forcing bank foreclosures, and, in general, wreaking devastation on ALL rural areas. It would be a disaster of a magnitude that would be well beyond political acceptability. Those that believe otherwise also believe that supply and demand quickly adjust to lower prices. If that were true, then crop agriculture would self-correct. But it is not and agriculture doesn't. It really is that simple.

So we're "putting more money into agriculture and yet we're driving more farmers out" and at the same time, with a safety net insuring a profit, "there is really no end to a degree of oversupply and low price." In such a trap, how can both of these outcomes be avoided? For an analysis of the structure of our agricultural system and policy possibilities, Donella Meadows addressed this issue at an invited address to the 1988 System Dynamics Conference,¹¹² she described the dynamics.

Only once have I tried to combine many of these concepts and in fact to deliver the central dynamic hypothesis of a complete, complex policy model. It was a column on the disappearance of the family farm, and it was based on a system dynamics study by Philip Budzik (1975).¹¹³

The driving force of the model was a positive feedback loop:

Farmers are caught in a vicious cycle. At any given price, for milk or grain or whatever, the most obvious way a farmer can earn more money is to produce more. So some of them do. But, since most of us are already drinking all the milk and eating all the grain we can, a larger supply means a lower price. Now, since the price is lower, every farmer has to produce more just to keep the same income. So every farmer tries to do that and some succeed, increasing production still more, dropping prices still further, forcing every farmer to produce still more.

The farmers are on a treadmill. Each one feels forced to expand whether or not he wants to, whether or not he can actually do a good job with more land or more cows. "Get bigger or get out" is the message. If the farmer succeeds in getting bigger, he turns the treadmill further, increasing output, reducing prices, forcing himself and others to expand even more in the future. Every time one farmer manages to stay on the treadmill by expanding, he knocks another farmer off.

The next important idea was that of bounded rationality:

Who's doing it to the farmers? The farmers are doing it to each other. They are stuck in a system where everyone's individual rational behavior produces a result that no one wants. If you don't believe that, ask the nearest farmer. They know what's happening.

Then came the ideas of counterintuitive behavior and policy resistance:

When, with the best of intentions, we help the farmers out of their troubles – with subsidies, low-interest loans, easier taxes, higher prices, better technologies – they can expand still more, produce more, and turn the treadmill even faster. Anything that gives a farmer the ability to expand puts another farmer out of business, sooner or later. When we help a large farm expand, it is usually several middle-size or small farms that bite the dust.

The final message is the unexpected leverage point and the policy recommendation:

There is one astonishingly simple (and at the moment politically unthinkable) way of doing that. Just plain limit the size of farms. Define some upper limit beyond which a farm cannot grow, high enough to capture economies of scale and a decent farm income, low enough to encourage healthy land, communities, and economy.

The limit should vary by crop and land type and change as technologies change. It would be most effective to set it not by acre, but by the amount of each commodity that each farm would be permitted to market. A limit in real commodity units would give the government a way of dealing with the perennial problem of overproduction. It would stabilize farm prices. It would give farmers the freedom to experiment with different management schemes to produce the limit at lower cost. It would encourage them to diversify their crops, making them less vulnerable. And since the total amount of each crop produced is fixed, any decrease in costs would mean an increase in farm income, not in farm size.

If the farm-size limit were set at a reasonable level, it would eliminate the need for farm subsidies, because farms would be profitable-without outside help. [May 11, 1985]

The importance of this example for this article is simply to demonstrate that the essence of a quite sophisticated model can be communicated in words, without diagrams, in just a few paragraphs.

Another important point is that the column did not exactly transform the 1985 U.S. Farm Bill. It did provide some ammunition for farmers, many of whom have come to their own realization about how the farm system works and are trying to instill some kind of marketing restriction. The policy that came out of the model is still unthinkable to politicians, who regard it as interference with the free market, which, of course, it is.¹¹⁴

¹¹² Donella Meadows, "System dynamics meets the press", *System Dynamics Review*, 5, pp. 69-80.

¹¹³ Phillip Budzik, 1975. "The Future of Vermont Dairy Farming," Masters thesis, Thayer School of Engineering, Dartmouth College, Hanover, NH 03755

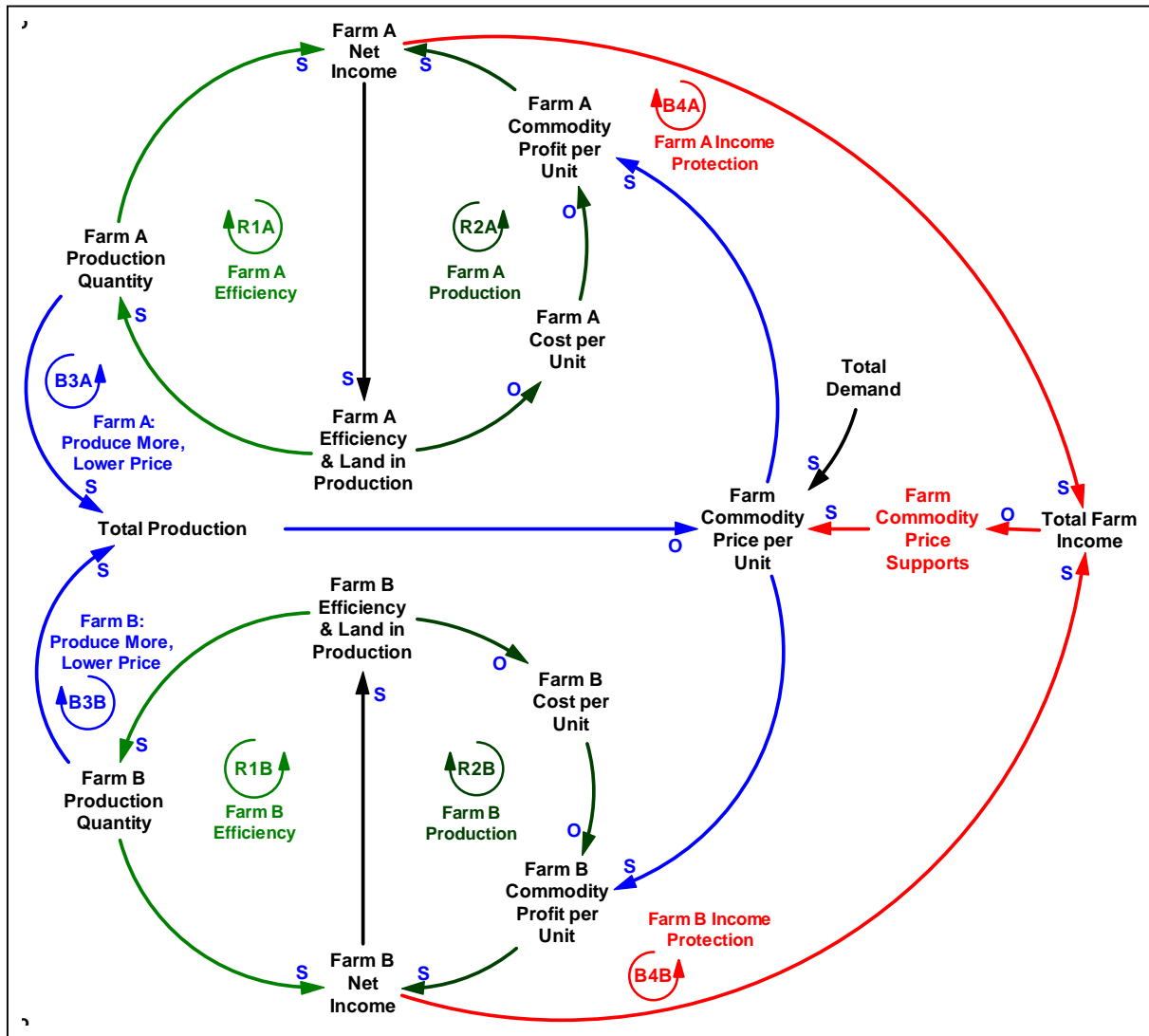
¹¹⁴ Some of her observations on the free market are included in the section on "A systems perspective on the free market."

The 90 calves born this year to Effling's cows represent a nine-month investment in money and labor. It'll be months before they're ready to go to market, but unless chronic low prices stage a turnaround, Effling and hundreds of cattle producers like him won't make a profit.

"We're barely making expenses," Effling said over coffee one chilly recent morning. "You just can't take it. It's got to end sometime."

More than 500 South Dakota cattle producers sold their herds last year, mirroring a trend around the country. Many of those who got out, and their colleagues who still are hanging on, blame years of low prices on a series of mergers and buyouts that has left 82 percent of American beef packing in the hands of four companies.

Figure 42. Price Supports Increase Income, But Do Not Affect Supply/Demand



Like consolidations among banks, airlines and defense contractors, the industry that makes the beef that winds up on the nation's dinner tables and fast-food menus is controlled by conglomerates: IBP Inc., ConAgra Inc., Cargill Inc. and Farmland Industries Inc.

The losers in this arrangement are, collectively, an American icon: the independent cowboy.

"Without restoring competition, we lose our freedom," said Mike Callicrate, who runs a 12,000-head cattle feedlot in St. Francis, Kan. "We've lost it to these corporations."

¹¹⁶ Though this example is actually one of an "oligopsony," the point is still valid; small farms are being absorbed into larger farms. *First American Heritage Dictionary* definition: "A market condition in which purchasers are so few that the actions of any one of them can materially affect price and the costs that competitors must pay." The counterpart to monopoly is monopsony.

Many cattle producers believe the big packers manipulate the system to depress prices, by using forward contracts to keep prices secret and provide them a captive supply of cattle. About a third of cattle are now sold this way, instead of through the traditional stockyards cash auction, and the trend is expected to grow.

Another limit could be reached when so much land is consumed by development that no more can be put into production *and* when efficiency is so high that production cannot be effectively increased. At such limits, farm commodity prices could rise to the point where farming is profitable without government subsidies or interference; however because of inelastic demand and limited supply, prices would rise drastically, prompting government action of some sort to address the shortage. Because of the inelasticity of both supply and demand, as well as the delays inherent in trying to adjust either supply or demand, it's a precarious and difficult-to-manage balancing act.¹¹⁷

What current policy does with respect to growth is to convert near-in farmers and ranchers, the owners of land with the greatest profit potential if converted to residential or industrial uses, into serendipitous speculators. The only way they see to get out of the death spiral is to sell off land to development.

Our policies don't allow farmers and ranchers to be "profitable farmers and ranchers." It practically forces them to oppose growth controls that discourage the loss of land for agriculture purposes. They're in a terrible predicament ... as is our society.

¹¹⁷ Similar problems with electric and gas power have arisen in early 2001 in California due to the same kind of inelasticity. California's electricity ordeal is referred to in the LA Times story in the section on "The growing infrastructure backlog."