



Rediscovering American Agriculture

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I. AGRICULTURE SINCE 1492

Since the quincentennial of Columbus' voyage produced many provocative reevaluations of American history, this seems also a good time to take a fresh look at what has happened to agriculture in this part of the world since 1492.

Doing so, I think, will reveal that the interpretation of our agricultural history has also been flawed. Most of us grew up with the notion that nothing was happening here agriculturally until the Europeans arrived—stories of Indians teaching Puritans how to plant corn notwithstanding. The popular interpretation sees Indians living almost exclusively on bison and going hungry a lot. Agriculture, as such, it is often assumed, didn't begin here until the Europeans arrived to clear the forests and introduce the plow.

In fact, agriculture was practiced here rather extensively for thousands of years before Columbus arrived. Once the English settled here they emulated native agriculture. As William Cronon points out, in New England both English and Indians practiced an agriculture that was "inextricably bound to the wheel of the seasons, both produced maize as their most important crop, both weeded and hilled their corn, [and] both relied on a wide range of different food sources."¹

Cronon goes on to point out that what distinguished European agriculture from native agriculture had more to do with animals and trees than it did with

¹William Cronon, *Changes in the Land* (New York: Hill and Wang, 1983) 127ff.

plants and production strategies. Europeans came with a European mosaic in their heads that led them to clearcut forests and maintain domesticated grazing animals; this was clearly contrary to the native way of thinking.² What Europeans brought was not an introduction of agriculture per se, nor even the introduction of a radically different kind of agriculture, but the introduction of a different attitude toward agriculture. Which agriculture has proven the more successful, however, may still be open to debate.

The fact that native agriculture was successful is not only evident from the fact that Europeans adopted much of it, but also from the fact that we are now rediscovering the wisdom of many of its methods. One of the principal differences between native and European agriculture is that native agriculture was primarily designed to "fit in" to the landscape while European agriculture was primarily designed to alter the landscape. The difference in attitude that lies behind that distinction provides the best starting point for rethinking American agriculture.

Perhaps one of the most brilliant essays for understanding the attitude of European

immigrants comes from the pen of Frederick Turner. In his book *Beyond Geography: The Western Spirit against the Wilderness*, Turner gives us not only a vivid picture of what the environment was like prior to 1492, but also of the predominant attitude toward this land that was held by the immigrants who followed Columbus. I think it was that attitude which shaped agriculture here. After describing in vivid detail what the landscape must have looked like when our forebears first walked across it—teeming with wildlife, thick with foliage—Turner remarks:

Had they been other than they were, they might have written a new mythology here. As it was they took inventory.³

It was because they approached the land from this perspective that they engaged in the kind of agriculture that became the model for the industrial world.

To our forebears this land was a catalog of resources waiting to be mined:

- bison waiting to be harvested
- trees waiting to be logged
- grasslands waiting to be plowed and planted into neat rows of corn
- rich, black soil, its nutrients waiting to be used
- aquifers waiting to be tapped and piped into center pivot irrigation systems to produce huge quantities of grain on marginal land.

This was an agriculture of resource exploitation!

Initially, as nutrients became depleted in one region, fields were abandoned to plow more virgin soil further west. Taking inventory revealed that there was always more where that came from. Later, when we started running out of new land, we shifted our strategy from primary resource exploitation to secondary resource exploitation—from mining nutrients directly from the soil to mining

²Ibid., 128, 126.

³Frederick Turner, *Beyond Geography: The Western Spirit against the Wilderness* (New Brunswick: Rutgers University, 1990) 256.

them from pockets of mineral deposits and transporting them to our fields. Thus the chemical era in agriculture began. But the attitude of taking inventory, of mining resources, of extracting cheap raw materials to produce wealth and power, continued to be the predominant paradigm that shaped both agriculture policy and agriculture practice.

This attitude, furthermore, was reinforced by a moral imperative: manifest destiny. Our ancestors believed they had been called to this land to “develop” its rich resources, just as surely as Columbus had been divinely inspired to “discover” it. The Puritans even saw it all as a moral obligation. They were put here to “build a new kingdom of God on earth,” and that included “taming the wilderness” and cutting down trees to plant corn. In their view, clear-cutting forests was not “deforestation” it was “the progress of cultivation.”⁴ Since the natives, not prone to taking inventory, practiced an agriculture of restraint, they were seen as failing to “develop” the land, and therefore failing to exercise their God-given responsibility to make use of it. Consequently the Europeans felt justified in taking over that responsibility—and with it, of course, the land.

The agriculture of restraint that natives practiced before the arrival of Columbus was likely developed in response to 15,000 years of experience. Until quite recently, we had dismissed that agriculture as “primitive” because it seemed so contrary to the “clean cultivation” mosaic familiar to the European mind, and because it didn’t appear to take full advantage of the rich resources available here. But today, as we begin to identify some of the principles of a sustainable agriculture, we are discovering that many of the principles of native agriculture are precisely the principles of sustainable agriculture.

In the Northern Plains, for example, the Arikara, Mandan, and Hidatsa tribes had evolved principles of agriculture that are being closely studied by the Carrington Research and Extension Center at North Dakota State University because of some of the similarities to sustainable agriculture research. Diversity, recycling, restrictive cultivation, moisture conservation, and selectivity based on bio-regionalism were among the key strategies for successful agriculture devised by those tribes. Now they are all principles very familiar to sustainable agriculture advocates. It was an agriculture that was successful then, and (we are rediscovering) can be successful now.

John Gardner, superintendent of the research center, enjoys wryly reminding his audiences that

native agriculture was an agriculture that normally kept the villages well fed, often with surpluses available for trade. It was designed to produce reliably under harsh growing conditions (like drought and frost). And it was an agriculture in which the men spent most of their time hunting and fishing, the women did all the work, and there were no taxes—and we thought we could improve on it!⁵

⁴Cronon, *Changes*, 126.

⁵Oral address, Bismark, ND, January 1991.

II. THE SUCCESS OF INDUSTRIAL AGRICULTURE

No one can dispute the fact that the inventory-taking approach to agriculture, which replaced native agriculture, was enormously successful. The fact itself is not surprising. Whenever there is an opportunity to mine resources stored up over millions of years, without regard for preserving or restoring those resources, the economic potential and the net economic return over the short term is, of course, enormous. We have all benefited from this agriculture of exploitation during the past 500 years.

It was this agriculture of exploitation that gave birth to thousands of farms and rural communities throughout the continent and made them economically successful. Population densities, in fact, exactly matched the number of farmers and ranchers required to manage these resource exploitation enterprises. Rangelands in the west tended to be sparsely populated, since mining nutrients from grasslands with roaming cattle required only a few ranchers per acre. Parts of the country suited for truck farming became very densely populated, since it required more labor to extract nutrients through vegetable production. But on the whole it was the resource exploitation approach to agriculture that populated the continent with family farms and thriving rural communities.

As the mechanical revolution began to sweep the countryside, farmers started replacing

labor with machinery. Modern equipment made it possible for fewer farmers to exploit larger acreages. The addition of off-farm inputs made it possible to control nutrient depletion and pest infestation on larger and larger acreages, and enabled farmers to specialize in one or two commodities. The result was increased production that eventually required an aggressive export trade scheme to remove surpluses from bulging government storage facilities.

This trend in over-production by fewer, larger, more specialized farms resulted in the decline of rural populations and with it a decline in the demand for local markets and locally produced inputs. That, in turn, caused small rural communities to lose their “pull” (the ability to attract local business). It also meant that less money stayed in local communities to support local activities. Money now tended to “flow through” rural communities to suppliers and processors in distant places.

Most industrialists, of course, argue that disappearing farms and rural communities will not affect the continued success of exploitation agriculture. Many economists see the continuing displacement of farms and rural communities as an inevitable and desirable part of progress and a clear sign of the success of agriculture. It is simply a matter of the invisible hand of free market competition weeding out economic inefficiencies. Just as farmers who didn’t make it during the past five decades were dismissed as “poor managers,” and disappearing rural communities were attributed to the technological advances of communication and transportation, so the future prospects of centralizing the whole food production industry into the hands of two or three multi-national conglomerates is viewed as economically desirable and inevitable.

Meanwhile agricultural economists continue to point to the almost miraculous success of industrial agriculture by using simplistic indicators of economic success and efficiency. Record yields per acre and record numbers of people fed by a single farmer have become popular benchmarks for defining success. In the meantime, industrialists promise even more fantastic successes for exploitation agriculture in the future through the marvels of high technology.

The result of all this is that the majority of Americans probably still believe that our industrial agriculture is the most successful agriculture in the world today. Meanwhile, no one has even noticed that we have relegated most of the wisdom of the agriculture that existed prior to 1492 to the dustbin of history.

III. TROUBLE

A growing number of people are conceding that industrial agriculture in America is in trouble. Among the most prominent problems are the environmental, the economic, and the social.

On the environmental front it is becoming increasingly difficult to defend current agricultural practices.

- There is a hole in the ozone now, and modern, industrial agriculture has at least contributed to its appearance.
- Our ground water is polluted, and it is now generally conceded that agriculture is one of the principal contributors.
- Aquifers are becoming depleted, and modern agriculture is one of the principal drains on that essential resource.

- Soil quality has deteriorated. That not only requires larger infusions of fertilizer to compensate nutrient depletion, but, as the World Resources Institute has demonstrated, it also makes agriculture more dependent on irrigation since such deteriorated soil no longer absorbs or retains water to its full potential.⁶

- The earth's biota (from earthworms to humans) has been damaged. Intensive cultivation and extensive use of inputs has decreased biological activity in soil, reducing phosphorus availability and soil tilth. And even if human health has not been adversely affected, the health of farmers and farm workers clearly has. The effects on wildlife and other forms of earth life have not yet been sufficiently documented, but some damage has clearly occurred.

On the economic front we are also becoming aware of serious problems.

In the first place, we now know that many of the efficiencies claimed for conventional agriculture were based on faulty accounting. Determining efficiencies by how many non-farmers a farmer feeds is politics, not economics. A more realistic economic ruler is how many calories of energy it takes to put a calorie of food on the table. By that measure, industrial agriculture does not fare very well. It has been determined, for example, that it takes:

- 100 calories of energy to put 1 calorie of potato chips on the table

⁶Paul Faeth et al., *Paying the Farm Bill* (Washington, DC: World Resources Institute, 1991) 32ff.

- 25 calories of energy to put 1 calorie of feedlot fed beef on the table
- 9 calories of energy to put 1 calorie of canned corn on the table.⁷

We now also know that we can no longer ignore the environmental costs of doing industrial agriculture. The costs of cleaning polluted lakes and streams, of taking soil sediment out of ditches, and of increased health problems (all of which we have tended to ignore or push into the future) now need to be accounted for. More and more the public is demanding that the liability for these costs be traced to their source.

In any case, it is now becoming clear that once we do proper accounting, the efficiencies claimed for resource exploitation agriculture begin to disappear. In the future the economic problems of resource-exploitation agriculture promise to become much more acute. The abundant nonrenewable resources that have fueled this agriculture are rapidly disappearing. As they become more scarce they will become increasingly cost-prohibitive. Finally, they will become fully depleted.

I am always amused when I am asked how long I will be able to mine the phosphorus embedded in the soil of my fields without bringing in additional phosphorus from off the farm. I generally respond by saying that there is land that has been farmed by these alternative methods for over 2,000 years without off-farm inputs, and according to projections I've seen no one is predicting that we will be able to continue mining phosphorus from known phosphorus deposits anywhere near that long.

The economics of modern resource-exploitation agriculture may also be in trouble on another flank. Alvin Toffler argues that we are moving into a new era of economic development that is based on "mind" rather than "muscle." He asserts that the smokestack industry, based on power associated with control of capital and the physical means of production, is over. Power in the future, he claims, will be based on the ability quickly to mobilize data and information into wealth-creating decisions.⁸

If that is true, then the productivity of future farming systems may depend more on the knowledge, innovation, and flexibility of the farmer than it will on the number of acres on the farm. The farmer, for example, who can respond to a micro-bakery's sudden demand for a particular quality wheat to produce a particular quality of bread for a new market, may have a distinct market advantage over the farmer who is locked into producing huge quantities of uniform wheat for the mass market.

We are also becoming aware of serious problems with resource-exploitation agriculture on the social front. While many experts still argue that the disappearance of farms and rural communities poses no threat to food security, there is growing evidence that this phenomenon could be more troubling than the industrial-minded are willing to admit.

⁷D. and M. Pimental, *Food, Energy, and Society* (New York: John Wiley, 1979) 164ff.

⁸Alvin Toffler, *Powershift* (New York: Bantam, 1990).

Consider, for example, that the next wave of migration of farmers off the land will necessarily lead to the centralization of farm management. The centralization of management will inevitably replace field management with front office management. Such a shift in management will put us well on the way to adopting the problems of Soviet agriculture as our own. As we know, Soviet agriculture did not suffer from lack of production potential, but from inefficient and ineffective management. And that has both economic and ecologic consequences.

The way in which the social phenomenon of farmers being removed from the land relates to the ecological health of the land and the economic health of a secure food production system was articulated best by Wendell Berry:

If agriculture is to remain productive, it must preserve the land, and the fertility and ecological health of the land: the land, that is, must be used well. A further requirement, therefore, is that if the land is to be used well, the people who use it must know it well, must be highly motivated to use it well, must know how to use it well, must have time to use it well, and must be able to afford to use it well.⁹

There is nothing that I can see in resource-exploitation agriculture (which has succeeded in effecting one of the greatest outmigrations of farmers off the land that the world has ever seen) that meets any of those essential requirements. In other words, the importance of keeping farmers on the land who know the land and have the authority and responsibility for making management decisions in the field has nothing to do with nostalgic inferences about saving the "family farm" or social justice imperatives about improving the quality of life for farmers. It has to do with maintaining agricultural productivity—it has to do with food security for ourselves and our children's children.

IV. CHOICES

As I see it, agriculture in America has come to a crossroads. This land has experienced both an agriculture of restraint and an agriculture of resource exploitation. At this juncture we have a choice—three choices, in fact:

1. The first option is to stay on our present course of resource-exploitation agriculture.

That would mean we would continue to centralize agriculture until it is concentrated into the hands of a few people. Many policymakers do not see that as a problem. Indeed an official from the Office of Management and Budget recently remarked that “if two or three farmers can bring in all of the food and fiber we need—who cares?” This choice, of course, hinges on the expectation that we can continue to find, or make, and afford the inputs necessary to fuel this kind of agriculture.

Personally, I don’t think this is a very realistic future. I think that the 500-year experiment in resource-exploitation agriculture is rapidly coming to a close.

2. The second option is to go with the new technological fix. A lot of folks today seem to be placing their bets on biotechnology to save us from the problems facing resource-exploitation agriculture. Personally, I’m pessimistic about the

⁹Wendell Berry, *What Are People For* (San Francisco: North Point, 1990) 147.

prospects for the new tools of this technology to rescue us. A number of problems lead me to that conclusion. Let me cite three:

a. In the first place, I don’t see evidence that we have gotten any better at predicting the side effects of introducing technologies that did not evolve with nature. Our track record for determining in advance potentially harmful side effects of new technologies is, to say the least, not impressive. Since this new technology has many vulnerabilities, it could be that we will just be ratcheting our current problems up a notch with the indiscriminate introduction of this technology.

b. Second, it seems that the introduction of this technology will lead us further down the path of ignoring whole-systems approaches to problems. Many of us hoped that one of the lessons we learned from the chemical era in agriculture is that there is no substitute for whole-systems approaches to problems. As John Muir reminded us so eloquently, we can never do just one thing. We live in a highly complex, interrelated eco-system in which everything is connected to everything else. That is why quick fixes never work, and never will.

c. Third, it is doubtful that the introduction of this technology into agriculture will benefit society as a whole. Every indication is that this technology will speed up the concentration of power and wealth into the hands of a few. This is not a technology that will place more power into the hands of the average citizen/farmer. These high-tech applications will be capital intensive, putting them out of the reach of most owner/operator producers. Patented genetically-engineered seeds will be controlled by large corporations. And the proposed substitution of genetically engineered, laboratory manufactured food for agriculturally grown food, will further remove control over the kind of food we can put on our tables from the average citizen. Early applications of this technology, from BGH to herbicide-resistance, appear to have little benefit for anyone except the companies who are introducing them.

3. Our third option is to return to some model of agricultural restraint. This option would require that we turn our energy and our intelligence to a more complete, whole-systems understanding of how nature works, how its various parts complement one another, and then find new ways to fit agriculture into the crannies of that system. This would require a readoption of principles and attitudes of the native agriculture practiced here before 1492, and then applying all of the ingenuity that we have acquired since then to enhancing that system.

V. CONCLUSION

As we contemplate our choices with respect to the agriculture of the future, it might be well for us to remember that our reign, as humans, on this planet has been relatively brief, and so in the larger scheme of things our survival on it does not come with much of a guarantee. In fact, if one were to lay odds, one might better bet on the insects, especially cockroaches, since they have survived longer than almost any other species. For that reason alone, it has always seemed ironic that we, would try to control insect damage to agricultural crops by killing the insects. The

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laws of evolution would suggest that we might have more success with a strategy of accommodation—of using insects instead of destroying them.

The point here is that we might increase our odds for success in agriculture if we opted for an agriculture of restraint—an agriculture based on biospherical understanding and respect, an agriculture that accommodates itself to nature, an agriculture that is fitted into the crannies that nature allows—rather than an agriculture of inventory-taking—an agriculture that takes without giving in return, an agriculture that ignores the evolutionary laws of the biosphere, an agriculture that believes in the fantasy that there will always be more where that came from.

It seems clear that such a shift in agriculture will indeed require that we “write a new mythology here” (Turner). Our ancestors may have been incapable of that task because of who they were. But now we have lived here for 500 years and, one hopes, learned a few things along the way. Perhaps now we are ready to see what our ancestors could not see—that the agriculture of restraint that was in place here had evolved over thousands of years of learning to live with this land, of learning to appreciate its gifts, recognize its limits, and accommodate to its curses.

Lewis Mumford suggested in 1926 that the immigrants that came to North America behaved the way they did out of “cultural necessity.” Mumford argued that it may have been the empty inner space (the cultural vacuum within) that determined their behavior with respect to the environment and each other rather than the vast expanse of geographical outer space, as argued by Frederick Turner.

As we contemplate the agriculture with which we want to evolve over the next 500 years, we might do well to give some attention to that inner space. I can think of no better place to begin that process than with one of the paragraphs from Mumford’s book:

Now we begin to see a little more clearly the state of mind out of which the great migrations to the New World became possible. The physical causes have been dwelt on often enough; it is important to recognize that a cultural necessity was at work at the same time. The old culture of the Middle Ages had broken down; the old heritage lingered on only in the “backward” and “unprogressive” countries like Italy and Spain, which drifted outside the main currents of the European mind. Men’s interests became externalized; externalized and abstract. They fixed their attention on some narrow aspect of experience, and they pushed that to the limit. Intelligent people were forced to choose between the fossilized shell of an old and complete culture, and the new culture, which in origin was thin, partial, abstract, and deliberately indifferent to man’s proper interests. Choosing the second, our Europeans already had one foot in America. Let them suffer

persecution, let the times get hard, let them fallout with their governments, let them dream of worldly success—and they will come swarming over the ocean. The groups that had most completely shaken off the old symbolisms were those that were most ready for the American adventure: they turned themselves easily to the mastery of the external environment. To them matter alone mattered.¹⁰

¹⁰Lewis Mumford, *The Golden Day* (New York: Horace Liveright, 1926) 30f.

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Rediscovering agriculture in America, then, requires that we discover a new mythology. If we are ever to escape the inventory-taking approach to agriculture and evolve with a more sustainable mode, then we need to find a culture in which more than matter, matters. And that, Mumford said “is nothing less than the effort to conceive a new world.”¹¹ Or, perhaps better, the effort to reconceive the old world that was already here when we came, but that we couldn’t see because we were who we were.

¹¹Ibid.,203.

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