In Search of Traditional Farm Wisdom For a More Sustainable Agriculture: A Study of Amish Farming and Society

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ABSTRACT


A religious society with a strong emphasis on family and community ties, the Amish are an agrarian people who have a long history of using less energy-intensive, albeit productive, agricultural methods. The low-input farming systems practiced today by Amish farmers have developed over 300 years and have sustained the Amish as one of the most persistent and successful subcultures in North America. Strict socio-religious rules control Amish farming practices. As a result, Amish agriculture depends on traditional elements, such as horse farming and hand labor, and therefore contrasts starkly with conventional high-input agriculture. However, contemporary Amish agriculture is a blend of old practices with new ideas, similar in many respects to the low-input sustainable practices that agricultural researchers are currently experimenting with and designing. The long continuous history of low-input sustainable production on many Amish farms offers researchers an unique opportunity to study the biological control of insect pests and diseases and nutrient cycling, which contribute to sustainability. Important to the success of the Amish as a traditional farming subculture is the extremely tight coupling of social and technological phenomena within their society. This observation has significant implications for the development of low-input sustainable agriculture for the larger society in which conventional agriculture often decouples farming technology from a strong cultural base.

INTRODUCTION

In many countries, traditional farming societies are rapidly disappearing. The Old Order Amish represent one of the few remaining traditional farming societies in temperate regions. These societies can be viewed as archives of agricultural knowledge which have endured over much longer periods of time than conventional farming technologies but are often forgotten by larger, more modern cultures. In many cases, including the Amish, the farming systems developed by these societies have sustained their culture for hundreds if not
thousands of years. Today, more and more countries, developing as well as developed, are seeking to grow food with greater consideration for sustained production and minimal environmental degradation. The study of farming systems used by surviving agrarian subcultures, which use low inputs of chemicals, can enhance the repertoire of farm managements for sustainable systems and create basic knowledge of how and why the old systems work and what aspects could be applied to new systems. However, perhaps even more importantly, study of traditional agrarian cultures can help larger societies rediscover traditional farm wisdom which has often been greatly diminished in conventional agriculture (Ehrenfeld, 1987).

The Old Order Amish represent one of the most conservative branches of the broad spectrum of existing Anabaptist faiths (Smith, 1957; Schreiber, 1962). The Anabaptist Movement began early in the sixteenth century in Switzerland, spread into Germany, Italy and Holland and formed the left wing of the Reformation (Smith, 1957; Stella, 1982). Modern Anabaptist groups include Mennonites, Hutterites and the Amish. Although all Anabaptists share an historical doctrine of separation from the world as part of their religious legacy (Article IV, Schleitheim Articles, 1527), the Old Order Amish distinguish themselves in the degree to which they abide by this doctrine (Schreiber, 1962). Like the Amish, the Hutterites are an agrarian subculture, however, the Hutterites have developed a socialistic life model, living in communistic colonies, and have accepted recent technology and state schools; whereas the Old Order Amish live on family-owned farms, avoid modern technology and have their own schools (Hostetler, 1980; Stella, 1982; Gross, 1985). It is possible to study active Amish farming communities only in the New World, where the Amish have been successful in maintaining their separateness. Any Amish remaining in Europe after emigrations to North America became re-assimilated into more liberal Anabaptist cultures (Hostetler, 1980).

The distinct separateness of the Amish is achieved by very strict sets of socio-religious rules, called the Ordnung, which create boundaries between them and the world (Huntington, 1956; Hostetler, 1980). For example, the Amish pace of life is very different from the modern world’s because horses are used for transportation instead of automobiles. They dress uniformly and they speak a German dialect among themselves which few non-Amish people know. They refuse to connect themselves to the modern world via telephone or electricity lines and they generally refuse government participation or assistance.

The primary unit of Amish society is a patriarchal family (Huntington, 1956; Schreiber, 1962; Hostetler, 1980). Groups of families are tightly connected as parts of an Amish church community or Gemeinde (Huntington, 1956; Hostetler, 1980). Physical churches are forbidden in Old Order Amish society; rather a community of baptized members which confess to the Dortrecht Confession of Faith (1632) and abide by the Ordnung forms their church (Huntington, 1956). Church services, marriages and funerals are held in homes
or barns of community members. Like their Anabaptist cousins, the Amish do not baptize infants because they believe that only adults can know the difference between good and evil (Article I, Schleitheim Articles, 1527) therefore only adults are members of the Amish church and subject to the rules of their church’s Ordnung. Members who disobey the rules are given two warnings and the opportunity to repent before being excommunicated and socially avoided by church members (this punishment is called Meidung) (Article 17, Dortrecht Confession, 1632). In this way, the unique integrity of Amish society is maintained (Huntington, 1956; Schreiber, 1962; Hostetler, 1980).

At the core of Amish society is an agrarian lifestyle. Tilling the soil has religious significance for the Amish based on Biblical interpretations (Hostetler, 1980). Sociologically, farming has allowed the Amish a large degree of self-sufficiency which reinforces their cultural separateness from the world. The rules ordain that an Amish man should above all other occupations, strive to support himself and his family by farming, and that parents should ensure their children also achieve this goal (Hostetler, 1980). However, the desire to farm as a way of life supersedes the rules, as farming “is a quieter life and one feels closer to God” (Amish man, personal communication, 1987). The social pressure for farming as the preferred Amish lifestyle, in combination with their deep respect for the soil has resulted in a strong sense of land stewardship. The Old Order Amish are one of the most persistent and successful subcultures in North America in spite of predictions that they would be absorbed into the larger American society (Huntington, 1956; Hostetler, 1980). The basic farming systems practiced by the Amish have sustained Amish society and are an integral part of its persistence and growth.

The largest settlement of Old Order Amish in the U.S.A. is located in Holmes Co., OH within 10 miles of the Ohio Agricultural Research and Development Center (Hostetler, 1980). In the summers of 1987 and 1988, we had interviews with a local Amish farmer about his farming methods. In the remainder of this paper, we will combine specific information about this particular Amish farmer’s agricultural practices with more general information on Amish agriculture and discuss the implications for low-input sustainable agriculture.

OBSERVATIONS

**Historical background**

Amish agriculture has a long and extremely rich heritage which is rooted in the historical development of Anabaptism during the Reformation period of European history. Following Martin Luther’s lead, Ulrich Zwingli formed the Reformed Church in Zurich, Switzerland in 1519. Among his followers in Zurich were three men who wanted even more radical reforms than Zwingli’s church offered. In particular, they wanted complete separation of church and
state and they insisted on adult baptism. When Zwingli refused to make these concessions, Felix Manz, Georg Blaurock and Conrad Grebel formed the Swiss Brethren Church in 1525 (Smith, 1957; Hostetler, 1980). They and their followers became known as Anabaptists after their practice of rebaptizing adult members. The movement spread among intellectuals and craftsmen in the cities of Germany, Holland (Smith, 1957) and northern Italy (Stella, 1967, 1969, 1982). The Schleitheim Articles, written in 1527, became the governing rules for the Swiss Anabaptists and are still used by contemporary Amish people.

The Anabaptist refusal to baptize infants and their insistence on complete separation of church and state deeply threatened the political and religious order of sixteenth, seventeenth and eighteenth century Europe. Anabaptists were persecuted, exiled and executed for 400 years (Smith, 1957). As a result, the movement soon moved out of the cities, where followers could be located easily by the authorities, and into the countryside among the peasants (Smith, 1957; Hostetler, 1980). The Anabaptist forefathers of the Amish found some refuge from political and religious persecution in the Vosges Mountains of the Alsace region of southeastern France and the Jura Mountains of northwestern Switzerland as tenants on large estates where they were often given the fringe areas of the landlord's property (Smith, 1957; Hostetler, 1980; Meyers, 1983). Here they were forced to make marginal land produce food or starve (Meyers, 1983). "To survive on these poor soils required unceasing application of labor and demanded that the best available talents be used to devise programs of farming that built up poor land and maintained fertility" (Kollmorgen, 1942). Anabaptist farmers cleared land, created meadows and pastures, and combined farming with beef and dairy cattle husbandry (Hostetler, 1980). In the seventeenth century, they practiced crop rotations, meadow culture and irrigation, feeding of cattle in stables including the use of mash byproducts of distillers, grew clover (Trifolium) and alfalfa (Medicago) as green manures, and used natural fertilizers including manure liquids and gypsum and lime (Correll, 1925; Kollmorgen, 1942; Hostetler, 1980; Meyers, 1983). The combination of environmental pressure to produce food on marginal land and their socio-religious orientation resulted in Anabaptists becoming renowned as innovative and superior farmers in seventeenth and eighteenth century Europe, particularly in Alsace (Smith, 1957; Seguy, 1973; Hostetler, 1980; Meyers, 1983). Soon after an expulsion of Amish from Markirch (Sainte Marie-aux-Mines) in 1712, local rulers wrote to Louis XIV complaining about the expulsion. The Anabaptists were said to "apply themselves with extraordinary care to agriculture, an occupation for which they have admirable knowledge"; they transform "sterile and dry lands" into "tilable lands and the most beautiful pastures of the province" the report said (Seguy, 1973; Hostetler, 1980).

The Amish split from the Swiss Brethren Anabaptists occurred in Alsace in 1693 under the leadership of Jacob Ammann (Smith, 1957; Hostetler, 1980). Ammann felt that the Brethren had become too lax in their observance of
certain rules and that there was a need to return to more strict discipline. In particular, he insisted on practice of Meidung for punishment of disobeying members and observance of specific dress codes (Smith, 1957; Hostetler, 1980). Followers of Ammann became known as the Amish. The rules which Jacob Ammann insisted his followers live by developed the separatism which is essential for the integrity of contemporary Amish society. Soon after the split in the early 1700s, the first Amish emigrated to North America because of political and environmental pressures in Europe (Hostetler, 1980). Initially settling in Pennsylvania (Smith, 1957; Hostetler, 1980), they brought with them the successful Anabaptist farming traditions developed in their homeland (Kollmorgen, 1942, 1943). Because of the Amish reverence for “the old ways”, many of these farming traditions are still being practiced by descendants of the early emigrants.

Agricultural practices

Although to the outside observer the Amish appear very homogeneous, there is an appreciable diversity in farming practices from one community to another (Hostetler, 1980), and therefore generalizations can produce a biased perception. However, there are certain general practices which characterize and distinguish Amish agriculture.

General farming

This has higher social status than specialized farming (Fletcher, 1932; Huntington, 1956; Hostetler, 1980). Social pressure necessitates a diversified farming system which involves animal husbandry in some form (Fig. 1). In Ohio, dairy farming has been and still is very important to the economic viability of Amish farmers (Fletcher, 1932; Oyler, 1963). Milk is sold to local manufacturers of Swiss cheese. Our case-study farmer has seven horses (Percherons for field work and standard breeds to pull the family buggy) and 14 Brown Swiss cows, although Holsteins are the most common breed for Amish and non-Amish dairy farmers in this area. Animal manure is almost a sacred entity in Amish culture for building and maintaining soil fertility (Hostetler, 1980). Many Amish farmers also have pigs, goats, chickens and or turkeys, and make additional income from breeding fine draft and carriage horses. Weekly livestock auctions are important economic and social components of Amish life in Holmes and Wayne counties in Ohio.

Horse farming

Probably one of the most well known Amish farming traditions is the use of horses instead of tractors. The Amish give many reasons for their insistence on this form of farm labor not the least of which is that tractors do not produce manure (Huntington, 1956; Hostetler, 1980) or reproduce (Logsdon, 1988).
An important result of this rule is that farms must be small enough to be worked by a team of horses. This restriction not only makes more land available to other Amishmen, but it also creates a limit to how much time a farmer spends on farming. Although hard work is a sacred part of Amish society, their rules also demand the men to take time to be good husbands, fathers and neighbors. In Ohio, Amish farms range from 18 to 100 ha (Fletcher, 1932; Schreiber, 1962); our case-study farmer has 50 ha, 30 ha tillable and 20 ha pasture and woods.

**Crop rotations**

Rotations of 3–5 year cycles are common (Fletcher, 1932; Hostetler, 1980). Our case-study farmer uses a 5-year rotation of hay–hay–corn–oats–winter wheat, with an occasional 2-year cycle of corn. Horse-drawn plowing of the soil is the tradition; however, this tillage pattern is beginning to change in parts of Holmes Co., OH where the Soil Conservation Service is encouraging Amish farmers to adopt conservation tillage to reduce erosion on the hillsides. The soil conservation program is gaining success because of the Amish land stewardship ethic and because of development of a horse-drawn no-till planter (Fig. 2). This program will influence farming practices by participating Amish farmers, as it works best with 2 years of continuous corn and typically requires herbicide use to control weeds.
Crop amendments

Traditionally, organic methods of crop production were used with animal and green manures and lime being used for fertility sources, cultivation for weed control and rotations for pest control. Today, most Ohio Amish farmers use petrochemicals to some extent. However, for economic reasons, when petrochemicals are used, the rates are often about half of that recommended (Ohio Cooperative Extension Service, personal communication, 1988). For example, chemical fertilizers supplement manures and herbicides are often used in combination with cultivation to control weeds. Although use of foliar insecticides to control insect pests in alfalfa is not uncommon, the Amish in Holmes Co. OH use soil insecticides only rarely. Our case-study farmer is an exception to the current trend in petrochemical use because he farms without chemical fertilizers or insecticides and only in rare events uses herbicides to control persistent perennial weeds locally. He composts manures for fertilizer. Because his 14 cows and seven horses do not produce enough manure for his needs, he and his sons clean out neighbors’ barns and broiler houses in return for the extra manure. Hog manure is transported into a pond on the farm where it remains for at least 60 days before being spread on the fields. Poultry manure is composted 2 years before use. Cow and horse manure is composted for 6 months. He cultivates twice to control weeds, controls pest problems with his crop rotations and is happy with his yields. When we discussed insect prob-
blems, his response was that alfalfa was the only crop in which he ever notices insect pests but he has never seen enough damage to concern him. His high pest-tolerance threshold is in stark contrast to the attitude of many non-Amish farmers.

Other farm activities

In addition to crop and animal production, many Amish farmers also manage woodlots for lumber (usually hardwoods), maple syrup production and fuel (Hostetler, 1980). Our case-study Amish farmer has a saw mill on his farm and sells hardwood lumber. Some craftsmen make and sell furniture or horse-drawn vehicles on the farm. The family vegetable garden, run by the women, not only supplies food for the family, but is an additional source of income when surpluses are sold. Fruit orchards are another component of many Amish farms, as well as bees for honey; our case-study farm has both (Fig. 3). In addition, our case-study farmer grinds his organic grains and sells them in a small unadvertised store on the farm.

Efficiency of Amish agriculture

In a paper published during the energy crisis of the 1970s, Johnson et al., (1977) compared energy budgets of Amish farms to non-Amish farms in three

Fig. 3. Part of an Amish farm showing the woodlot, orchard and family vegetable garden.
states. In the ridge and valley region of central Pennsylvania, the Amish farms had higher yields (3151 Mcal ha\(^{-1}\)) and energy ratios (1.009, based on ratios of energy outputs to inputs) than their non-Amish counterparts (3071 Mcal ha\(^{-1}\) and energy ratio of 0.553). By contrast, in eastern Illinois where the topography is flat and non-Amish farms are five times as large as Amish farms, energy ratios were still greater but yields were considerably less for the Amish farmers (0.886 and 2879 Mcal ha\(^{-1}\)) than non-Amish (0.707 and 4644 Mcal ha\(^{-1}\)) (Johnson et al., 1977). In southwestern Wisconsin, Amish energy ratios were much higher (1.614) than those for the non-Amish (0.274), but Amish yields were slightly less (1305 vs. 1668 Mcal ha\(^{-1}\)) (Johnson et al., 1977). In a more detailed study of Amish and non-Amish dairy farms in Pennsylvania, Craumer (1979) found similar results. In addition, modeling exercises with his data indicated that other factors besides the use of draft animals on Amish farms and even lack of electricity contribute to Amish energy efficiency. Craumer (1979) suggested that these other factors include crop rotation, more extensive (or intensive) use of manures, avoidance of diminishing marginal returns on fertilizer use, and judicious substitution of labor for machinery. The results of these studies suggest that under conditions suited to small-scale diversified farming, Amish farming is energy efficient.

Economically, it is not surprising that higher energy efficiencies of Amish farmers leads to greater economic security and stability. While small-scale horse farming may not have the potential to make large gross financial returns like large-scale mechanized farming, in general, Amish farmers are not suffering the financial difficulties which currently are driving so many non-Amish farmers off their farms (Logsdon, 1988). Amish farming methods and general frugality can account for this difference. For example, one Amish family on a 57-ha farm figured monthly household expenses to be about $400 and a cost of less than $50 for an acre of 150-bushel corn, whereas Ohio State University's model budget cost was $393 acre\(^{-1}\) (Logsdon, 1988). This family derives most of its income from a dairy herd of 20–25 Guernseys. Marketing almost all crops through livestock, they gross $50 000, of which $22 000 is expenses, including interest and taxes (Logsdon, 1988).

Although very difficult to quantify in economic models, biological efficiency of Amish farming is an integral part of the economic security of successful Amish farms (Logsdon, 1988). In a study conducted in Holmes Co., OH, Jackson (1988) considered effects of Amish farming practices on soil characteristics. She compared Amish tilled vs. non-Amish no-tilled fields and found that soil enzyme (alkaline phosphatase) activity, organic-matter content and infiltration rates were higher and bulk density was lower in Amish vs. no-till non-Amish soil (Jackson, 1988). These patterns typically are associated positively with soil productivity and “sustainability” (Brady, 1974; Poincelot, 1986).
DISCUSSION

Physical labor is a religiously sanctioned aspect of Amish culture including farming (Huntington, 1956) and it is an important component of their efficiency and success as farmers today and historically (Meyers, 1983). Our case-study Amish farmer calculated that he works approximately 15 h day\(^{-1}\). In addition, he has several sons working with him. Large families provide the Amish with an important source of labor. In seventeenth and eighteenth century Europe, “the principles of family occupancy, family entrepreneurship, continuity and motivation for labor were combined in the management of the farms” (Hostetler, 1980). As long-term tenants in Europe, those principles served Anabaptist farmers well and as land owners in America these traditions have persisted among the Amish. After many discussions and several court cases, the Amish have won the right to not send their children to high school. It is their belief that as a peasant people, education beyond the eighth grade is not only unnecessary but that it also threatens their religious beliefs and the integrity of their culture (Huntington, 1956; Hostetler, 1980). Without the cooperation of their adolescent children, both Amish farming and society probably would suffer seriously.

While most non-Amish farmers would not be willing to conduct as much hand labor as Amish farmers and give up their tractors for a team of draft horses, and legally cannot deprive their children of high school education, many of the basic principles of Amish agriculture such as diversification, crop rotations, use of animal and green manures are feasible for small-scale non-Amish farmers seeking to farm with lower chemical inputs than conventional systems require. Indeed, considering how many non-Amish farmers and their wives must work off their farms at full-time jobs in order to keep their farms and maintain middle-class lifestyles, the Amish may actually spend less labor hours than non-Amish farming families.

Many of the sustainable practices that agricultural researchers discuss and are incorporating into experimental designs are innovative blends of old practices with new ideas. The Amish are not opposed to incorporating new ways of farming which have stood the test of time and increase the economic self-sufficiency of their families and communities without jeopardizing their religion (Oyler, 1963; Tank, 1975; Meyers, 1983). As a result, Amish agriculture is a blend of old practices with new ideas. Because the Amish have such a long history of experience as designers and practitioners of low-input sustainable agriculture, researchers and non-Amish practitioners of sustainable agriculture could learn a great deal from Amish farmers; not only in terms of determining what types of sustainable systems are economically and environmentally viable, but also in terms of understanding why they work. In particular, Amish farms which have been especially successful for many years, such as our
case-study farm, offer researchers the opportunity to study ecological processes and mechanisms which contribute to sustainability under equilibrium conditions, such as biological control of insect pests and diseases and nutrient cycling. Newly established experiments on sustainable agriculture cannot offer this opportunity. On a regional basis, landscape ecologists could learn about the effects of sustainable agriculture on landscapes by studying Amish communities. The small scale and diversity (crop rotations, pastures, woodlots, etc.) of Amish farming (Fig. 4) most certainly have significant impact on landscape heterogeneity (Fig. 5) and flows of materials (e.g. water and soil) and energy (e.g. solar irradiation and wind) through geographical regions settled
Fig. 5. An Amish community showing the landscape diversity (woodlots interspersed with pastures and fields).

by Amish compared with agricultural regions which are farmed conventionally with large monocultures year after year.

Ehrenfeld (1987) argues that conventional agriculture has generalized the technology of farming, minimizing the significance of the relationship between farmers and their particular land and he beseeches designers of the new sustainable agriculture to “make systematic efforts to rediscover traditional farm wisdom and incorporate it in the new system”. Although many aspects of Amish culture are not desirable for general society, the Amish are a living preservation of traditional farm wisdom and study of their agriculture and society has important implications for sustainable agriculture. Logsdon (1988) suggests that Amish agriculture is vital because Amish culture sanctifies for the individual the virtues that make good farming a prudent practice of ecology: moderation, simplicity of life, frugality, neighborliness, family stability and financial common sense. Furthermore, Amish culture not only sanctifies these values, but also provides a supportive community in which they can flourish (Logsdon, 1988). Finally, the support of strong cultural traditions help make the Amish less vulnerable to severe economic dislocations (Logsdon, 1988). Stoltzfus (1973) suggests that the Amish capacity to generate cultural motivation for simplicity of consumption and respect for nature has important implications for general ecological concerns, in addition to agriculture. For example, in the
context of adaptive strategies for economic survival, he points out that because the Amish do not use electricity, they are compensatorily inventive in developing alternative energy sources (Stoltzfus, 1973).

Study of the integral relationship between Amish society and Amish agriculture suggests the importance of a tight coupling between social and technological concerns for a successful sustainable agriculture. The pace and materialism of modern American and western European cultures contrast starkly with the quiet peacefulness of the Amish lifestyle, however it was not that long ago that differences in lifestyle between the cultures were not so pronounced. As our societies have metamorphosed from dominantly rural cultures into dominantly urban and suburban societies, farming and associated agricultural work, particularly on a small scale, have lost much of their former social respectability. The emphasis placed on the technological aspects of agricultural production during the green revolution helped to alleviate this respectability problem, but now many farmers are suffering the economic consequences, and society in general is suffering the environmental consequences of the high material inputs required to support the agricultural methods developed during that era. The new sustainable revolution in agriculture seeks to ameliorate these problems. The vitality of Amish agriculture teaches the importance of sustainable agricultural technologies having a cultural base which includes a strong land stewardship ethic and a commitment to that ethical system on the part of all society members.

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