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IN THE  
COLONIAL CHESAPEAKE**

by  
**Elizabeth B. Pryor**



**THE NATIONAL COLONIAL FARM**

**RESEARCH REPORT NO. 13**

**The Accokeek Foundation, Inc.**

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## FORAGE CROPS IN THE COLONIAL CHESAPEAKE

"GRASS is the sine qua non of  
LIVESTOCK, the essential of DUNG!  
and therefore the nursery of CORN  
and of all FARMING PRODUCTS!"(1)

John Beale Bordley  
Essays and Notes on Husbandry  
and Other Rural Affairs

The early history of grass cultivation by Chesapeake area farmers is one of indifference, discouragement, and, finally, experimentation. The colonies of Maryland and Virginia were not naturally suited to the growth of forage crops. Neither the acid soil nor warm climate favored them, and the ignorance of the region's farmers about their cultivation made them a late development in the husbandry of the upper South. Not until disaster struck, in the form of thousands of dying cattle and hogs, did planters attempt to raise food for their livestock. Even then, meadow cultivation was poorly understood. It was nearly the last quarter of the eighteenth century before farmers began to make real progress in providing enough food for their cattle, as well as using grass crops to nourish and protect their soil.

It was the woodlands, not meadowlands, that impressed the first men to arrive on the shores of the Chesapeake Bay. Nonetheless, several early voyagers

remarked on the abundance of marsh grass that appeared along the coast. The author of "A Relation of Maryland" observed in 1635 that "there is great store of Marsh ground also, that with good husbandry will make as rich as any in the world."<sup>2</sup> Another immigrant reported that "On the plains and in the open fields there is great abundance of grass; but the country is, for the most part, thickly wooded."<sup>3</sup> The grasses described were of two sorts: wild rye and broom straw. Both grew abundantly in the Chesapeake watershed, and were frequently described as "long and thicke stalked" or as "goodlie meadows."<sup>4</sup> Their luxuriant appearance, however, belied their coarse texture and rank taste. Only in the spring, when "the green Marshes and Savannahs...appear'd in fresh Verdue," were the natural grasslands suitable for grazing; by the early summer the grass was brittle and sour.<sup>5</sup> Captain John Smith was one of the first to recognize this, and warned that the marsh grass was "very rank...although they be good and sweet in the summer, they will deceive your cattle in winter...."<sup>6</sup> Not only was the grass of both the fresh and salt marshes poor in flavor, it lacked enough nutrients to keep the livestock healthy and fat. Thomas Budd, writing from the northern part of the

Chesapeake Bay, attested to this in 1685: "the Hay being course, which is chiefly gotten on the fresh Marshes, the Cattel loseth their flesh in the Winter,<sup>7</sup> and become very poor, except we give them Corn...."

As late as 1767, colonists were still complaining about such indigenous grasses as broom straw. "This their common pasture grass is so rank, and dry," stated a Swede visiting North Carolina, "that they make their brooms of it, as they do here with heath of birchen rods...<sup>8</sup>taste it nothing will."

The various Indian tribes of the region had not raised livestock, and there were few upland meadows to supplement the coarse wild hay. The American Natives had, however, consistently burned away the forest underbrush to produce an open area in which to attract and hunt game. The result was a grassy savannah beneath the towering trees, so well cleared that one could easily ride horseback through the woods without staying on the road. Mistakenly giving nature credit for the Indians' handiwork, an early Maryland traveler noted that the "woods moreover are passable, not filled with thorns or undergrowth, but arranged by nature for pasture for animals, and for affording pleasure to men."<sup>9</sup> The colonists did not hesitate to use these



areas for their own benefit, and they became the earliest forage areas. Together with roots, nuts, and other mast, they provided -- at least in the summer -- abundant food for the cattle and hogs which the immigrants brought from England.

For most of the seventeenth century, and the early part of the eighteenth, livestock survived by this foraging. "The marshes, and woods, and old fields is good range for stock in the spring, summer and fall," wrote Hugh Jones at the beginning of the eighteenth century, "and the hogs will run fat with certain roots of flags and reeds, which abounding in the marshes, they root up and eat."<sup>10</sup> The mild climate also proved amenable to foraging, and many did not bother to house their cattle. The early settlers were adventurers, not farmers, and were happy to let the animals scavenge on their own. As the Chesapeake economy rapidly shifted toward tobacco culture, the planters had less time to spare for cultivation of anything besides the "Imperial Weed." "Tobacco is our staple, is our all and indeed leaves no room for anything else; it requires the attendance of all our hands and exacts their utmost labour, the whole year round..." admitted Benedict Leonard Calvert in 1729.<sup>11</sup> Scarce, expensive labor and

valuable land were not to be wasted on the production of forage crops, when, it was believed, they could be utilized more profitably in production of that all-absorbing cash crop. As more and more land was needed for tobacco (for it depleted the soil in a few years and was thus continually planted on virgin soil), and the numbers of settlers in the Chesapeake increased, however, the amount of natural forage rapidly decreased. In oldest settlements the shortage of natural cattle food became a problem barely fifty years after the initial colonization. This scarcity, coupled with a series of bitter cold winters, produced a desperate situation by the end of the seventeenth century. During the winter of 1694-1695, over 25,000 head of cattle and 62,373 hogs died in the province of Maryland alone, forcing the Governor and Council to consider measures to ward off starvation.<sup>12</sup> On the frontier, farmers continued to allow their animals to roam freely, identifying them by marks on their ears, and rounding them up only once a year for fattening. But in the more settled regions, especially of Maryland, the farmers never reverted to the old method of free-ranging. Commodity records show a marked increase in grain and hay production, perhaps in

response to the disaster of 1694-1695.<sup>13</sup> In the next century, the Chesapeake farmer would have to learn to both shelter and feed his livestock, and a continuing problem would be the production of enough litter to keep the animals each winter.

The great rise in planter interest in meadowland during the first half of the eighteenth century is shown dramatically by two different sources. The first, descriptions of plantations offered for sale and advertised in the Maryland Gazette, gives a good picture of the increasing value of properties containing grasslands. Between 1728 and 1734, only two plantations of those advertised considered meadows of enough importance to include in the estate description. Orchards, gardens, outbuildings, soil type, or woodlands might be chosen to enhance the description, but meadows were clearly not yet of enough value to merit mentioning. By mid-century this was clearly no longer the case. Twenty-two percent of the plantations offered for sale in 1752 boasted meadows in their description, in words similar to the following: "about 20 Acres of good Meadow, dry and well-ditched, and a considerable Quantity more, on Sundry parts of the said Land, may be made good Meadow for small Expense."<sup>13</sup>

The next year the number of advertisements which mentioned meadows had jumped to 25 percent; in 1755 it had reached nearly one-third. A decade later, 60 percent felt that advertisement of a meadow would enhance the market value of their farm. Even those without an established meadow felt obliged to remark on the suitability of their property for such a purpose. One man described a farm of 275 acres, one hundred of which was cultivated, concluding that "with a little Trouble there may be a Meadow made of 30 Acres."<sup>14</sup> Another typical advertisement noted that "the soil tho' thin, is kind and fertile, and much good Meadow might be made upon it at an easy Rate."<sup>15</sup>

These findings are reinforced by evidence in property inventories for Prince George's County, Maryland, 1696-1760. In the early years of this period, estate inventories had little or no information on hay or the equipment used to cultivate meadows. Between 1696 and 1706 only four out of sixty inventories listed a grass scythe, hay rake, or other tool definitely associated with haying.<sup>16</sup> Indeed, until 1732 the percentages of estates definitely owning haying equipment remains small - about 7.5 percent. In the next decade, however, the increased interest in

grass culture seems to have caused more farmers to purchase haying equipment, for by 1746 such equipment was included in 36 percent of the inventories. (Ninety-two percent of large estates--those holding at least 300 acres or listing more than five slaves had such equipment, many in quantities that would suggest extensive meadow lands.<sup>17</sup>) The percentage of farms holding tools of this kind increased again between 1746 and 1754. By the latter date 56 percent owned at least one grass scythe.<sup>18</sup> By 1771 almost 75 percent boasted haying equipment, and those which did not were almost universally of a class that left little behind them besides "a sett of old close."<sup>19</sup> At the same time, the inventories also began to include assessments of hay or grass seed in stock, an indication that such possessions were becoming increasingly valuable.<sup>20</sup> Thus the three decades before the American Revolution were clearly a time of transition in meadow culture. Initially viewed as unnecessary because of widespread natural grazing areas, they came to be tentatively cultivated when stock could no longer support themselves in the wild. As the benefits of planting meadows became more apparent, large numbers of farmers

began to experiment with their culture, until, by the 1770s, meadowlands had become an important part of most farms.

By 1782, George Washington could write that an "improved meadow in this part of the country many miles from a large town, sells for thirty to sixty pounds an acre.... I am conscious, that Dow's meadow alone, if it is as large and as good as he represents it, would yield more nett profit annually, than the labor of a dozen Negroes on Mrs. French's farm...."<sup>21</sup> This extraordinary land value, of course, was a direct result of the desperate need for forage. Despite experiments with straw, grain, turnips, pumpkins, peas and beans, as well as many different varieties of grasses, most farmers were unable to fulfill the needs of their livestock. Thus, despite the fact that he annually raised thousands of tons of hay, even so notable a farmer as Thomas Jefferson had to buy extra grain each winter to keep his stock comfortable. In Virginia, he sadly commented, farmers were "eternally on the scramble" for fodder; there was a constant "want of winter and summer food...."<sup>22</sup> Landon Carter was another who frequently ran out of fodder. In March 1770, the situation became so serious that the strength

of many of his cows gave out. A number died and those that remained, Carter recorded, were fed valuable corn and hops, or "what trash I can get out of the great Marsh...."<sup>23</sup>

George Washington frequently bought hay from his neighbors when they were able to produce a little extra.<sup>24</sup> Earlier, in Somerset County, Maryland, another farmer solved his problem by renting all of the meadow lands of a nearby farm. The deed in part read that

it shall be Lawfull for the proper stocke of William Planor...without Lett Interruption trouble expulsion or evicksion...to feed & grase on any grassland pastors or feedings of the sid Thomas Price...and further doth Covenant & grant to & with the said Willliam Planor that he hath full power and good right & property of him to mow or reape & Cart away any grase or sedge without lett or molestation.

In 1665, the year of the indenture, Planor paid an annual fee of six shillings for this privilege. One hundred years later it would have been considerably more.<sup>25</sup>

Another Maryland man waged a decade long war to supply himself with adequate amounts of fodder. In 1770, James Wilson, a midling planter from the eastern shore, began recording the exact time his fodder ran

out each winter -- usually well before the arrival of the spring grass. In January 1773 he noted that his corn stacks were gone, and that he was issuing the last of his dry fodder to cattle, sheep, horses, and pigs. A month later he had to turn them out to forage for themselves, several weeks ahead of plan. That year he closely monitored the amount of hay, straw, corn fodder, and grain he could give to the stock, and put off feeding them dry food as long as possible. Not until Christmas week did he begin to give them hay; nonetheless, corn stalks were completely gone by the first of February, and the straw depleted by the twentieth of the month. In the next few years, he experimented with varieties of hay and clover, methods of stacking, and times of feeding, yet his dry fodder was always gone by early March. In 1777, he set his hands to work cutting up 200,000 corn stalks -- 15,000 of which were completed in twenty days -- and stacking eighteen stacks of hay, and seven of straw, to feed his twenty-five head of stock. Still, he had to turn his sheep out in January, and cattle in early February. Not until 1780, when he and his men made twenty-five fodder stacks and three of wheat and oat straw, was he able to proudly record that on April 1 he still had two stacks of corn stalks left.<sup>26</sup>



As native fodder became increasingly scarce, and the need rose for cultivated hay, grass crops took on a minor commercial importance. Those who had neglected their crops, or had bad luck, bought the excess produced by their neighbors. George Washington, for example, paid £14 for 4,003 pounds of hay grown by William Digges across the Potomac River.<sup>27</sup> Others purchased oats for feed, as well as straw, and even coarse marsh grass.<sup>28</sup> Those traveling on horseback, or by oxcart, had to purchase food for their animals, and travelers' journals are filled with accounts of spontaneous transactions with local farmers.<sup>29</sup> So profitable had the business become that some farmers were sacrificing their own stock to make a commercial profit, and agriculturalists began to complain that it was "a sin against good husbandry to sell off the hay of a farm."<sup>30</sup> Before the American Revolution the practice was widespread enough that the Maryland assembly voted to regulate the weights and measures of hay within the town of Baltimore.<sup>31</sup> Enterprising farmers were beginning to advertise their forage in the Maryland Gazette. Read such an ad:

Choice fresh Meadow Hay at 3/6 per  
Hundred Ready Money, or 4/0 if  
Book'd; Wheat and Oat straw at 17/6  
per thousand, or 20s if Book'd.(32)

In the early eighteenth century, the farmer who struggled to make the transition from free-range to winter feeding had a number of alternatives open to him. One of the earliest, and most lasting in popularity, was to gather the dry tops and leaves of corn in a method called "pulling fodder." Later the stalks were also used, especially for litter.<sup>33</sup> "In the month of September, when the maize has obtained its greatest growth..." wrote an early eighteenth century observer, "the strongest blades are cut off for fodder....The stocks and roots are torn up during the winter, when the ground is loose, to make the fields clean."<sup>34</sup> September seems always to have been the chosen month to pull fodder, for it was sunny enough to cure it well, yet came after the main harvest rush. It was also important to wait until after the ears had been well dried before pulling fodder, or valuable grain would be wasted. In particularly good curing weather it was tempting to begin pulling fodder too soon, in order to gain extra winter feed, and Landon Carter, for one, faced an annual conundrum as to which was preferable: a higher grain yield or abundant fodder. He characteristically took the conservative approach, and stuck with his father's ways. On

September 7, 1771 he wrote:

Much is said about cutting tops and getting fodder, because it is much fired this drye weather. I serched my corn, and find much will be spoiled if I begin so soon. The Question is, shall I save a little fodder for my creatures who browze upon hay, herbs, and shrubs; or shall I save a little corn for myself and people, who cannot make bread of either hay, fodder, leaves, or shurbs? Therefore I shall defer that work to a little longer time. Perhaps my father's rule of not beginning before Sept. 6, Old Stile, will be a good one. If so it will not be before the 17th New Stile.(35)

Carter also faced the problem of a labor shortage during the period when fodder was to be pulled. It was an enormous and tedious task to strip the individual blades from stalks, and cut the tops from thousands of corn plants, then gather, turn, cure, and haul them. It was a time of year when other activities were also pressing, and the difficulty of scheduling the work force made him nervous about the winter food supply. Carter was not the only planter who faced this problem. In lower Virginia, on the Dangerfield plantation, for example, fodder pulling was so important that even the family tutor, imported from Scotland at considerable expense, was pressed into service in the corn field.

In 1799, Maryland agriculturalist John Beale Bordley wrote a description of pulling fodder, a process which had probably changed little since the previous century. "Near the end of September or first of October," he advised, "with sharpened hoes, cut up the maize stalks close to the ground; having first stripped the blades and cut off the tops, but always leaving the ears on and pile the stalks & corn in pyramidal form, in small parcels, on the turnings, or headlands to cure." Landon Carter was pleased to find that such fodder kept well in the stack. After one year in which the cattle did not consume his entire supply, he wrote that he ordered the old fodder "to be stacked joining the Present stack, and really it looks as well as it did when first stacked...."<sup>38</sup> An alternative method was to tie the green leaves in bundles, and keep the tops in heaps near the cut field,<sup>39</sup> allowing the cattle to browse freely from the stack.<sup>39</sup> Thomas Jefferson estimated that an acre of corn stacked this way yielded about four hundred pounds of fodder. Since eight to ten pounds fed a horse each night and a winter was reckoned at 130 days, it took approximately three and one quarter acres to feed each animal.<sup>40</sup> Those who could, fed the more succulent blades to the

horses, reserving the dry tops for cattle food.<sup>41</sup> For all, fodder pulling was an essential practice, combining as it did the need for winter forage and the necessity of clearing the corn field. Indeed, Landon Carter thought it so important that he concluded "a bad crop of corn, makes a bad cowyard."<sup>42</sup>

Most settlers were unenthusiastic, at least initially, about planting grasses. Colonial farmers were loath to grow anything that did not spring up with ease, and it was not until the fodder situation became really critical that experimentation with true meadows began. As noted above, however, these were inferior both in quality and in quantity; neither were they improved by the farmer's general ineptitude. "They are the slovenliest husbandmen Imaginable....," sneered an Englishman in 1732. "Their hay is the coarsest Sedge, Cut with an hook and dried without Turning or Cocking."<sup>43</sup>

As horses sickened from the rank grass, and haystacks proved inadequate, farmers were forced to experiment with artificial meadows, that is, fields planted expressly for use as grasslands. The earliest of these were extensions of the native marshlands. Clever planters found that they could increase the

amount of grass by diverting streams, or building dikes and embankments to keep an area well-flooded with water. This method was particularly popular in the northern Chesapeake. Israel Acrelius, an early historian of the region, noted that between 1745 and 1760 many thousands of acres of marshland were cultivated in this manner. "The mode of procedure is to enclose a certain amount of swamp with a bank thrown up quite high (five to ten feet) so as to keep out the water (the ebb and the tides)...," he explained. The land was then allowed to remain dry until the grasses sprouted, after which the level of water was carefully controlled. It was only at "great expense" that the industrious Swedes of the area were able to construct the elaborate embankments, and they were vulnerable to high tides, and tunnelling animals such as muskrats or crayfish. But the experiments greatly enhanced the quality of the grass, as well as the value of the land. In 1751, Acrelius remarked, the price of an acre of swamp meadow, rose as high as "six hundred dollars copper coin."<sup>44</sup>

Peter Kalm, who travelled through Pennsylvania in 1748, noted another type of meadow watering. By this method dry lands were made suitable for the marsh

grasses by irrigation systems, which were frequently quite elaborate. Farmers looked for streams on ground higher than that they wished to cultivate for a meadow, and channelled them to flow through the meadow in ditches dug for the purpose. Dikes were built near springs to raise the water level, and wooden gutters fitted to carry water from less convenient streams. Kalm was surprised to see that one such canal extended around an entire hillside for over a mile before being emptied into a lush grassland.<sup>45</sup> That farmers greatly valued these meadows is again seen in the inflated price of such acreage, and the frequent disputes over rights to the waterings when large tracts were divided.<sup>46</sup> The renowned naturalist John Bartram was one who encouraged his grasslands by means of irrigation systems, and tried to promote the practice among his fellow-farmers: "Whenever a farmer can water his meadows," he declared to a Russian visiting his farm in 1769, "the greatest crops of the best hay, and excellent after-grass, are the sure rewards of his labours."<sup>47</sup> The author of American Husbandry agreed. "Good meadow lands are very scarce," he wrote as late as 1775, "except where water can be thrown over them, a husbandry not practiced near so much as it ought."<sup>48</sup>

The first efforts at meadow culture aimed only at increasing the natural growth of the wild grasses. In the eighteenth century, however, planters began to sow their own seed in what came to be called "artificial" meadows. Initially, they paid little attention to varieties. The slow and untutored methods of cutting grass meant that ripe seed often spilled out onto the field. This was supplemented by whatever was collected with the chaff around the bottom of the haystack. Sedge, broom grass, and wild rye—all were mixed together with any English grasses that had found their way into the countryside. Unfortunately there were plenty of weed seeds mingling with the grasses. Thistles and wild garlic, both introduced from Europe, caused the most harm. The resulting hay was little better in quality than that gathered from the marsh, but it was thicker and more easily nourished or harvested. Farmers paid scant attention to the natural likes and dislikes of their animals, preferring to think of them as capable of subsisting on practically anything. Peter Kalm, who was well versed in European agricultural methods, was surprised by this. On a trip through southern Pennsylvania and Delaware he "observed several plants, which the horses and cows preferred to



all others. They were wild in this country and likewise grew well on the driest and poorest ground, where no other plants would succeed. But the inhabitants did not know how to turn this to their advantage...."<sup>49</sup> To carefully save and cultivate such a wild plant took a great deal more work than the farmers, preoccupied with tobacco, were willing to spend. They could make do with the array of wild grasses which came in from their meadows. For as long as possible this is exactly what they did.

It is difficult to pinpoint the precise time when farmers began to distinguish between the various European grasses, and to experiment with individual varieties for use as hay and pasturage. The first adventurers from England were, of course, familiar with many meadow plants, and even in 1635 Lord Baltimore instructed prospective immigrants to include in their baggage "Good store of a claver grasse seede, to make good meadow."<sup>50</sup> Despite this, clover fields were rare anywhere in the New World until the eighteenth century. John Bartram began experiments with lucerne (or alfalfa) in 1738, the results of which were not recorded.<sup>51</sup> Not until around 1750, when the tobacco culture was waning and livestock and grain gaining in

importance, do descriptions of grasslands containing varietal information become common. Andrew Burnaby, traveling between Annapolis and Philadelphia in 1759, was pleased to see the land well cultivated and "beautifully laid out into fields of clover, grain, and flax."<sup>52</sup> About this time Landon Carter began to grow burnet and lucerne at his Virginia plantation, Sabine Hall. Although he had little luck with either, he would continue his experiments on these and other forage crops until his death in 1778.<sup>53</sup> George Washington ordered a "pretty large assortment of Grass Seeds" when he began serious agricultural work at Mount Vernon in 1759. The mix included lucerne, sainfoin, and clover. A few years later he ordered rye grass, and hop trefoil as well.<sup>54</sup> In the 1760s several advertisements in the Maryland Gazette specifically mention fields of timothy.<sup>55</sup> Even a farmer of modest means, such as James Wilson, had tried his hand at clover cultivation by the late 1760s, and a man of affluence like Charles Carroll could try burnet, clover, rye and several varieties of wild English grass.<sup>56</sup> Such carefully grown fields of grass were still experimental, of course, but they offered a significant improvement over the old wild meadows.

They also began to furnish a native stock of seeds, and to improve the land so depleted by tobacco and corn. By 1781 Thomas Jefferson could say of Virginia: "Our grasses are Lucerne, St. Foin, Burnet, Timothy, ray and orchard grass; red, white, and yellow clover; greensward, blue grass, and crab grass."<sup>57</sup>

While they awaited results from the European field grasses, or continued to gather a small and bitter harvest of sedge and corn fodder, Chesapeake planters were forced to give their stock a wide variety of foods to keep them alive. No single food had proved an invaluable source of fodder. Some of the less careful farmers simply turned their stock out onto the stubble fields, orchards, or bare ground that had sprung up with weeds, assuming that they would be their own best guide to suitable food. Even Landon Carter was forced to do this in times of drought, or when his haystacks gave out in mid-winter.<sup>58</sup> Such practice greatly angered John Beale Bordley, who saw it as not only detrimental to the cattle, but abusive to the land. Old fields of sour grass, bushes, and briers, he wrote, were unsightly, an obvious indication of the irresponsibility of the area's planters. "On this their ill-fated horses, cows, oxen, and sheep are

promiscuously turned early in the season, before there is a bite," he fumed, "but they nibble off the scanty growth of rubbish as it rises. Here they continue till winter; sometimes through the winter; so that the ground becomes poached and trod to a dead closeness."<sup>59</sup>

When livestock was not thus "pastured" a wide variety of foods were given to the animals. George Washington fed chopped rye straw to his horses, as well as pea and bean vines.<sup>60</sup> Landon Carter was another who recorded that pea vines were "excellent provender" and found that his horses were so fond of them that they tore them from the haystacks.<sup>61</sup> Carter also used wheat chaff and straw to feed calves; clover and rye grass for lambing ewes; corn fodder for the new lambs; and a mixture of pea vines, rye straw, wheat straw, and corn for his oxen. When everything else gave out, including the sedge hay he harvested, he gave the animals shelled corn. (The results were not always laudable. Several ewes died when left too long on the wet clover, and lambs also died from eating the rough corn stalks.)<sup>62</sup>

Hogs were fattened on peaches and apples which grew in abundance around the Chesapeake Bay.<sup>63</sup> Thomas Jefferson thought clover was the best summer feed for hogs.<sup>64</sup> Root vegetables such as turnips, potatoes, or

carrots were also fed to the livestock, though this type of feeding never gained the prominence that it did in England. John Beale Bordley applauded those who took the trouble to give juicy vegetables to their cattle, but thought even this could be improved by boiling them with salt and chaff or straw, to make a nutritious mash, or "drank" as he called it. "A drank for keeping cattle may be made thus: roots, chaff or cut straw, and salt, boiled together in a good quantity of water: the roots cut or mashed..." Bordley<sup>65</sup> advised.

As farmers in the Chesapeake region realized their need for reliable hay crops, they began to experiment, not only with varieties of grass, but methods of cultivation. A few really dedicated agriculturalists -- Landon Carter, George Washington, John Bartram, John Beale Bordley, and their colleagues -- conducted these experiments in a systematic fashion, noted results, and shared their information. The average farmer simply tried new seeds, new fields, or different times for sowing and reaping each year. All of the results were mixed. With no native grasses to domesticate, the varieties had to be imported from England or continental Europe. The seed was difficult to obtain,

and was frequently unusable when it arrived. Moreover, few European grasses were really suited to the soil and climate of North America. The many manuals of husbandry which came into the colonies around 1759 extolled the virtues of grasses and legumes, for agriculturalists in England were at that time beginning to understand their importance in restoring depleted soils. Philip Miller's Gardener's Dictionary, a book which greatly influenced (among others) Washington and Charles Carroll, highly recommended the use of vetch, sainfoin, and lucerne. John Mills and Thomas Hale, whose works were equally popular, also advocated lucerne production, as well as the cultivation of rye (or ray) grass. But the American farmer who began to grow these crops was generally disappointed. Most of the grasses were adapted to the moist, mild climate of England, and tended to turn brown and ripen too early during the hot American summers. The soils of Maryland and Virginia was also less than ideal for the cultivation of forage crops. Whereas grasses grew best in a light sweet soil, the Chesapeake area could offer little but a rich heavy clay, much of it, by the eighteenth century, sadly abused. George Washington admitted, near the close of a long agricultural career,

that despite all of his efforts, no grass, not even clover, really did well at Mount Vernon. The problem, he determined, was the soil. "It must be pleasing to a Cultivator, to possess land which will yield clover kindly," he told Thomas Jefferson in 1796,

for it is certainly a great Desiderata in Husbandry. My soil, without very good dressings, does not produce it well: owing, I believe, to its stiffness, hardness at bottom; and retention of Water....(66)

In the early trials with English grasses they generally ripened too quickly and thus yielded poorly. Observed one traveler: "The hay fields...on hills, in the open, or on some elevated locations especially those exposed to the sun, looked brown, and dry. Several people from Virginia told me that on account of the great heat and drought the meadows and pastures almost always had a brown color and looked as if they were burnt." <sup>67</sup> George Washington also bemoaned this climate, which had little advantage for hay crops. When the famous English agriculturalist Arthur Young offered to send him seeds of many European grasses, Washington accepted the gift but added, "Early grasses, unless a species can be found that will stand a hot sun, and often-times severe droughts in the summer

months, without much expence of cultivation, would suit  
our climate best."<sup>68</sup>

Thus, while the number of meadows in the colonial Chesapeake greatly increased during the first half of the eighteenth century, there were still very few farmers who could point to flourishing fields of varietal grasses, or consistently successful patterns of cultivation. In an attempt to find a suitable forage crop -- one which would produce well, nourish the cattle, and thrive in the hot climate -- ambitious planters experimented on every field they could spare. Charles Carroll was probably the most extreme example of this. Between 1764 and 1768 he sent seed orders to England for lucerne, vetch, kidney vetch, bird's foot trefoil, burnet, white clover, ray grass, gray peas, Siberian vetch, and even the seeds of several common English weeds, which he hoped would flourish in Maryland.<sup>69</sup> Jefferson grew ray grass, saintfoin, lucerne, clover, and timothy, as well as succory, and several vetches, at Monticello.<sup>70</sup> And in one year, 1760, Washington tried clover, rye grass, orchard grass, trefoil, and timothy on his Virginia lands.<sup>71</sup>



Of these grasses, the two most successful were timothy and clover. Both were Old World plants. Clover was grown in England, where it was generally mixed with rye grass, but timothy, though native to the British Isles, where it was called "cat tail grass," was generally ignored. Its introduction to the Chesapeake area dated from the early eighteenth century, when Timothy Hanson, who had grown it successfully in the Carolinas, and for whom it was named, travelled through the area. Occasionally it was also called "Herd's grass" after a man who had had similiar luck growing the grass in New England. Both clover and timothy were able to withstand the fierce heat and heavy soils of Maryland and Virginia; both provided shade and ground cover for farm fields, and produced good hay crops that did not ripen too quickly. Though originally planted only as an experiment by pioneers such as Jefferson and Bordley, by the 1790s it was the most prevalent of the grass crops.<sup>72</sup> George Washington wrote that by this date timothy was the only grass grown in Fairfax County, Virginia because it was so well suited to the hot climate.<sup>73</sup> From Delaware, an observer of the farming scene wrote, late in the period, that "oats and various kinds of grass, more

especially Timothy & Clover, are cultivated for the use of the cattle."<sup>74</sup> William Strickland, another important agriculturalist, thought the two so beneficial that if they could be combined into the same field they would produce the perfect American fodder. Unfortunately, because of the difference in ripening times,<sup>75</sup> his experiments were not successful.

It was difficult to start any artificial meadow in America, for seed was hard to obtain, and what could actually be gotten was often of inferior quality. There is no evidence that the nurserymen, who began to do business in the mid-eighteenth century, carried grass seed. Once established, a few farmers raised their own seed, but this precluded pasturing and entailed a double harvest of some crops, as well as a great deal of work to dry, thresh out, collect, and store the seed.<sup>76</sup> Most farmers of the colonial period thus acquired their seed through their contacts in England. George Washington ordered nearly all of his seed this way until after the American Revolution. Account books of many others, including Charles Carroll of Maryland, are filled with lists of grass seed, the arrival of which was eagerly anticipated.<sup>77</sup> When the seed actually reached its destination, it was often

disappointing. Weeks aboard ship frequently resulted in waterlogged, vermin infested, or mildewed seeds. Washington had to constantly remind his factor of "the necessity of putting all these seeds in Cabbin, or some place where the closeness, and heat of the ship may not destroy the Vegetive virtue of them, which scarce ever fails to happen in a contrary case."<sup>78</sup> To a seed merchant, whom he believed had sold him clover seed completely lacking in "vegetive virtue," he was even more blunt:

the disappointment I would not have sustained for fifty pounds, because fifty pounds will not buy me as much seed as I expected to raise from the four acres on which I sowed the bushel of defective seed which has occasioned me the loss of a season.(79)

Charles Carroll, who often let the seedsman determine quantities and varieties for him, also felt that it was important to stress the precautions needed to insure that the seed arrived safely. He directed his contact to procure seed still in the pod or husk to help prevent damage from the damp air or heat of the ship. Like Washington, he frequently lost entire crops through bad seed. "I lost all the Ray Grass seed Grey Pease etc. sent me the year before Last if they were

worth anything when Put on board by the Heat of the Ships, to the Amount of seven or eight pounds Sterling and all my Labour in sowing them as not one Came up,"<sup>80</sup> he wrote sadly in 1766.

Once seed was procured, the farmer had to prepare his ground for sowing. Fields were usually old corn, wheat, or tobacco grounds. Near the end of the eighteenth century, planters, recognizing the importance of grasses in crop rotation, began to utilize their best acreage for meadow. Most of the meadows were surrounded by ditches, and some had irrigation systems. "I am Cleaning and new fitting up my meadow Canals bank and ditches on both sides,"<sup>81</sup> recorded Landon Carter in 1766. James Allison's Maryland farm had meadow ditching eighteen inches wide and three feet deep.<sup>82</sup> Several advertisements for estates, registered in the Maryland Gazette,<sup>83</sup> mention meadows that were "dry and well ditched." Many of these advertisements also specify fencing in connection with grasslands; this was advantageous for keeping in grazing cattle -- and keeping them out near harvest time, when their hoofs would damage the flowering plants. Nearly all agriculturalists on both sides of the Atlantic considered good fencing a necessity.

Thomas Tusser, one of the more creative of the farming advisors, put the problem in rhyme. For "feare of drie Summer," he wrote of the grassland: "Then hedge them and ditch them, bestow theron pence:/ corne, meadow and pasture, aske always good fence."<sup>84</sup>

Grasses require finely broken, or friable, soil, and thus Philip Miller and other experts recommended at least two harrowings to prepare the seed bed. It is doubtful if many American farmers took this much trouble. Landon Carter alluded to this when he wrote that he believed his poor crops of timothy were due to ground that "so long dry and hardened with heat and cool winds was unfit for any vegetation....Yet," he complained, "everybody recommends the sowing it without any plowing the ground and only crop harrowing the seed in."<sup>85</sup> Only dedicated planters such as Washington took the trouble to mellow and smooth their ground. To sow clover, Washington plowed the field three times, harrowed it twice, then rolled it twice. For ray grass and hop trefoil he harrowed the land twice with a brush harrow.<sup>86</sup> Washington also dunged the land, tried using plaster of Paris (or gypsum) to sweeten it, and experimented with the amount of fertilizer, depth it was plowed in, and time of year it was spread.<sup>87</sup> His

guide, Philip Miller, would have applauded him. "Dung is an universal manure for grass," he wrote, "and the more mellow and rotten it is the better...." <sup>88</sup> But there were few farmers dedicated enough to take on this extra work. Most considered that the miscellaneous droppings left by roving cattle was manure enough.

Very few farmers tested their seed before sowing-- Washington and Landon Carter being notable exceptions. <sup>89</sup> Most simply scattered or drilled the seed directly onto the fields. Philip Miller strongly advocated sowing the seeds in drills, generally three feet apart, to aid cultivation, especially weeding, which he thought essential to any grass crop. Thomas Hale, author of the Compleat Book of Husbandry, concurred, even to the spacing of the rows. Landon Carter sowed his lucerne in this manner, but five feet apart, with beans between the rows to provide shade. <sup>90</sup>

Most colonial farmers' time was too occupied, however, for them to worry about weeding their meadowlands, and thus they sowed their seed by the easier broadcast method. Indeed, Landon Carter found that the broadcast method yielded better crops, at least of vetch. <sup>91</sup> "All seeds are usually sowed broadcast," wrote James Tilton from Delaware, "and it is usual to mix ashes or fine

dust with the small seeds to facilitate the sowing."<sup>92</sup>  
This method of filling out the finer seeds was also used in Maryland, where James Wilson mixed clover seed with wheat chaff before planting. Most seeds were simply scattered on the ground, then rolled or harrowed in. Bordley, however, developed a type of planting box, which, when shaken, distributed seed evenly over the field.<sup>93</sup>

The time of sowing varied from grass to grass. Generally it was done in cool, dry weather, either early spring or fall. As a guide to the time of planting English farming manuals were an active hindrance, for the warmer winters and earlier springs made many crops possible through winter in Britain that did not fare well in America. Thomas Hale could therefore recommend that clover and vetch be put in the ground in mid-February, and lucerne in April, dates that were generally a month too early around the Chesapeake Bay. Thomas Jones did not plant clover until April, and expert John Bordley thought that, for Maryland, March 20 was the ideal date.<sup>94</sup> The few who<sup>95</sup> tried fall sowing for clover found it did not pay. Farmers tried sowing timothy at all seasons, and finally concluded that autumn planting was the most

profitable for that crop.<sup>96</sup> In general it was a period of experimentation with the time and method of seeding grassfields. English advice was almost universally inappropriate, and the American farmer was left to try his own timing and cultivation techniques.

If the seed proved good, and the weather was reasonably dry, most grass was growing well after six weeks. Young grasses, with their shallow roots and tender plants, were to be protected from livestock, but once the growth was established many farmers chose to use the fields for pasturage. Care was advised when pasturing livestock, for certain plants, for example clover, were injurious to the beasts if eaten in large quantities, and others, such as vetch, lucerne, or sainfoin were harmed if the cattle trampled them too long. Stubble fields and orchards were also used as pasture, and of course fallow grassland that had grown up in wild grasses. Most experts believed that permanent pastures were preferable to casual grazing on this type of land, but in the eighteenth century they had yet to resolve the complexities of proper diet, effective timing (so that seed or hay was not lost), and the disadvantage of heavy hooves.<sup>97</sup> Even John Beale Bordley, who noted that livestock was pastured



for six to seven months of the year, and who railed against those who turned their animals loose on wastelands, had yet to completely balance the advantages of what he called "spontaneous manuring" and the disadvantages of uprooted plants and close-packed ground.<sup>98</sup>

Thus, like so many other aspects of grass cultivation, the methods of pasturage were left to the whim or expertise of the individual farmer. James Wilson, for example, fed calves on the clover fields, while George Washington used a mixture of timothy and rue for the purpose.<sup>99</sup>

The author of American Husbandry recommended the second growth of lucerne for pasturing.<sup>100</sup>

John Smyth, who farmed in southern Maryland in the early 1770s "planted a quantity of faulty wheat, such as was unfit for sale or use, in my tobacco ground...which proved extremely useful and beneficial...in affording a most excellent rich succulent pasture for milch cows, and colts...."<sup>101</sup>

In only one thing did most of those commenting on colonial agriculture agree: the need for improvement in all types of pasturing. "In a word," stated Peter Kalm, "the grain fields, the meadows, the forest, the cattle, etc. are treated with equal carelessness...."<sup>102</sup>

In 1755 Philip Miller wrote, "how many Pastures may be

seen almost over-run with...Weeds...when a small  
Expense if applied in time, would have entirely  
exterpated them."<sup>103</sup>

Despite this and similiar pleas, most farmers were too indifferent or preoccupied to bother with the care of standing grass, except for an occasional watering. Often times luxuriant meadows were cut green in the spring before they matured enough for hay. Jefferson, for example, cut his clover in early May for "green feed."<sup>104</sup> Lucerne and sainfoin were other grasses well adapted for early cutting.<sup>105</sup> Most of the farmers' attention however, was saved for mowing the mature grass, usually early in the summer. Careful husbandmen watched for the time when the blossoms were at their peak; this was the ideal moment for harvest. Others simply fit haying in when they were less occupied with competing chores. All had to carefully watch the weather as well as the grass, for rain would prevent the cut hay from curing properly. Once begun, it was imperative that there be mowers and rakers enough to complete the job quickly. "If meadow be forward, be mowing of same," warned Thomas Tusser.

but mowe as the makers may well  
overcome:  
Take heed to the weather, the wind  
and the skie,  
if danger approacheth, then cock  
apace crie....

Set mowers a mowing, where meadow is  
growne,  
the longer now standing the worse to  
be mowne.(106)

There was much discrepancy from farm to farm about the best time for haying. Washington cut clover in early June, timothy the next month, and wild marsh grass in August. Some years he was still gathering hay in September.<sup>107</sup> Thomas Jones began to mow hay in June and was carting it in late in August. Like Washington he harvested timothy after clover. In the year 1781 he spent approximately 15 percent of his time in hay making.<sup>108</sup> Landon Carter worked in haying whenever he could, and sometimes was at it well into November. Like others he worried that such a late harvest would injure the fodder -- as indeed it did -- but felt that cash crops, such as wheat and tobacco, must take priority over haying. "Fodder and Pease will certainly be injured for want of gathering," he noted in September 1770. "The former begins to dry and the patch is quite covered with the tassles." Still, year after year he sacrificed the hay to his tobacco: "as we must save that the other must suffer."<sup>109</sup> Part of the reason for the long haying season was the fact that many kinds of grass, for example clover and sainfoin, could be cut twice. This was a boon to winter feeding,<sup>110</sup> but a problem where labor was scarce.

Once begun, haying involved arduous and constant work to cut, cure, and gather the grass. More than one author, including Thomas Tusser, referred to the process as a "battle."

Go muster thy servants, be captaine  
thy selfe,  
providing them weapon and other like  
pelfe.  
Get bottles and wallets, keepe field  
in the heat,  
the feare is as much, as the danger  
is great.  
With tossing and raking and settling  
on cox,  
grasse laterlie in swathes is hay  
for an ox.  
That done, go and cart it and have  
it away  
the battle is fought, ye have gotten  
the day.(111)

Teams of men began cutting the grass with sickles, scythes, and reap hooks. Ideally it was mowed close to the ground, though this was difficult where the ground was uneven, or two different grasses were grown together. The grass was then spread at intervals throughout the field to dry. For several days it was turned, spread, and cocked up in heaps at night, to guard against the damp. It was then gathered up and either loaded onto wagons and taken to the farmyard or stacked in the field. Clover and vetch took longer to dry than some other grasses, and more advanced farmers

considered drying the latter in a kiln. <sup>112</sup>  
Occasionally lands were so wet that the grass had to be  
brought out of the meadow to dry. <sup>113</sup> Except in these  
boggy situations it was considered that one man could  
mow an acre to an acre and a half a day. <sup>114</sup>

Stacking hay was important for insuring its  
usability during the winter. The hay had to be  
completely dry and well tamped down, with a rounded, or  
thatched, top that would shed water. Thomas Jefferson  
noted that even with these precautions some of the hay  
would spoil, and found that generally it was better to  
keep stacked clover "under barracks." He observed that  
in Pennsylvania hay was made into stacks of three to  
five tons, but that the larger and more firmly packed  
English stacks kept better. <sup>115</sup> James Tilton, writing  
to an acquaintance in France, mentioned that clover  
stacks were also housed in Delaware.

Our crops of hay are stacked out of  
doors except clover, which requires  
housing. These stacks are commonly  
made round or square, and carved up  
in a bulbous form to a point at top.  
Sometimes, however, long ricks are  
made by those who have large crops.  
Grain is preserved in the same  
manner; oats, however, is more apt  
to spoil in stacks, & therefore more  
commonly housed than other  
grains. (116)

Thomas Tusser summed up his advice to mowers and hay-makers this way:

Reape wel, scatter not, gather  
cleane that is shorne,  
Binde fast, shock apace. have an  
eie to thy corne.  
Lade safe, carrie home, follow time  
being faire.  
gone eiest in the barne, it is out  
of despaire.(117)

Cultivation of grass for seed followed much the same manner, except at harvest time. As the eighteenth century progressed the number of farmers who raised their own seed increased. Shipping seed from England had always been an uncertain business, and with the advent of the American Revolution shipments were cut off altogether. Timothy seed was not available from the mother country, and clover seed, the next most popular variety, was difficult to obtain. The best farmers wanted to be able to save seed from their healthiest and most productive stock. All farmers could save money by raising some grass for seed; they also obtained a greater degree of control over its quality and storing.

Ideally fields set aside for seed culture were allowed to ripen longer on the stalk before cutting. After the flowers had fallen the grass was watched

carefully for signs that the seed cases, or husks, were turning yellow. Timing was again important, for early harvesting could mean immature seed, and if left too long the pods would over-ripen, and spill the seed on the ground. Landon Carter thought that mowing timothy too early could also make the separation of seed and husk more difficult. "It must just begin to shed before it is cut I believe," he noted in his diary, "to make the threshing out easier."<sup>118</sup> The cut grass was gathered with great care, and dried like hay. It had to be stacked immediately, for if left in the fields after drying, the pods would burst and scatter the seed. After careful carting and stacking, the seeds<sup>119</sup> were threshed out during the slack winter months.

Some experts thought that clover seed should be kept in the husk until spring, then threshed just before use, and the records of at least one Maryland farmer show that he followed this rule.<sup>120</sup> Farm journals indicate that grasses were cut for seed about a month after they could have been made into hay -- generally late July and August -- but that the seed was threshed whenever there were a few spare hours.<sup>121</sup> After threshing, the seed was stored in cloth bags, and kept well away from the damp, or vermin. The hulls or seed casings were

often fed to cattle, as was the hay, after threshing. From his farm near Baltimore, Richard Parkinson, described the method of seed production used by his neighbors. Like many other aspects of American husbandry, it was geared more to ease than productivity. "The methods the Americans take to preserve the seed," Parkinson wrote of timothy culture, "is they go into the meadow, with a sickle, before the timothy is mown, and cut off the heads, put them into a bag, and throw them on the ground for several days. By this means if rain comes it sometimes spoils the seed...."<sup>122</sup>

#### Tools

A brush sithe and grasse sithe with  
rifle to stand,  
A cradle for barlie, with rub-stone  
and sand:  
Sharpe sickle and weeding hooke,  
haie fork and rake.  
A meake for the pease, and to swing  
up the brake.  
Short rakes for to gather up barlie  
to binde,  
And greater to rake up such leavings  
behinde:  
A rake for to hale up the fitches  
that lie,  
A pike for to pike them up hand-  
some to drie....  
Sharpe cutting shade, for the  
dividing of mow,  
With skeeppat and skauel, that marsh  
men alow:



A sickle to cut with, a didall  
and crome,  
For draning of ditches, that noies  
thee at home.(123)

The tools described in this late sixteenth century poem by Thomas Tusser were essentially the same as those used by American farmers throughout the colonial period. These farmers did most of their field work by hand. Plows were rare, as were harrows, though on progressive estates these implements were becoming more common. The brush harrow, a light-weight tool which only slightly scratched the surface of a field, was recommended by Miller, Hale, and other authors, as the ideal instrument for working grass seed into the ground. A roller, generally a large elm or oak log with the bark removed, was used to level the ground or lightly press seeds into the soil. Many estate inventories list these, along with the hay forks, hoes, scythes, sickles, rakes, and grindstones needed for grass cultivation. Ox carts and yokes, or wagons were probably essential for a farmer raising any significant amount of hay. The list of tools recorded by a experimenting farmer in Maryland, who in 1779 grew clover and timothy, was probably representative:

1 Wagon and Geers	1 Rowler
2 OxCarts	1 Sledge
3 Ox Yokes With 2 Chains	8 Rakes
3 Plows with Geers	2 Bar Shovels
1 pair light Harrows	2 Seed Lips
2 Corn Harrows	2 Seed Boxes
2 dutch fann	2 Mowes with 5 wedges
1 cutting box with knife	2 Spades
1 Wheel barrow	1 Shovel
2 2-bush Measures	3 Pitch-forks
Carpenter's Tools	3 Dung-forks
3 Mattocks	1 Dung Drag
5 old Hoes	4 Scythes
5 Axes	7 old Sickles(124)

In the second half of the eighteenth century some innovative tools were developed to aid those interested in hay cultivation. Bordley developed a device for rapidly and evenly sowing tiny grass seeds. It consisted of a box, seven feet square, and three inches deep, divided into seven parts. Each part would lay over a drill when the box was drawn by a horse. Holes were cut into the partitioned box, and paper pasted over them so that the seed would slowly filter out as the box was shaken. <sup>125</sup> Another new implement was the "eradicator" described by Thomas Hale. This was a very large fork, with a broad handle fifteen feet long, and three prongs, each twenty inches in length, notched at the sides, and joined together with a strong iron shoulder. It was meant to aid the farmer in digging stumps out of his meadows. The long handle was used

for leverage, as the serrated prongs firmly grasped the roots of the stump.<sup>126</sup> Improvements were also made to scythes during this period. In Pennsylvania, for example the German farmers developed a small, thin version of the English scythe, which, with its shorter handle, was well-suited to the irrigated meadows which were prevalent throughout the Chesapeake area.<sup>127</sup> The increased use of forage crops by area farmers may well have influenced the growing popularity of the plow. With more food available for stock, the farmers could better afford to keep the draft animals necessary for plowing and harrowing. Conservative Landon Carter, however, was one who held the use of plows and the keeping of draft animals in disdain. More extra food was needed to feed horses or oxen, he maintained, than was produced with the help of the plow. "To feed the Creatures with Corn no Crop can support it...", Carter complained. "All the advantage then I get is to kill 4 or 5 of these oxen by beating them to make them do all and that is the sum and substance of this mighty business of plowing."<sup>128</sup> Most farmers, of course, did not agree. Plows were rapidly being recognized as labor-saving devices, which more effectively turned up the soil, and which could be used to plow under stubble, grass, or manure, to enrich the earth.

With the advancement of forage culture came modifications to farm structures, or new farm buildings meant for hay storage. The importance of keeping hay sheltered from winds which would scatter it, or rain, which would quickly ruin it, had been known for many centuries. Thomas Tusser suggested keeping each variety of hay and straw separate, and storing as much of it as possible indoors. Farmers without room to do this were instructed to cover their haystacks as best they could, and to thatch the tops to keep out rain. <sup>129</sup>

Bordley pleaded with farmers to keep their animals sheltered in winter, to feed them rations of hay, rather than to allow the cattle to stand in field and farmyard to eat directly from the stacks. The advantages of this he thought made "all the difference between an husbandman's poverty and his riches." The housing of cattle, Bordley wrote, would not only aid the health of the beast, but would eliminate wasted fodder, and would make it possible for the farmer to easily collect dung for fertilizer that would otherwise be randomly scattered, and therefore lost. <sup>130</sup> There is some evidence that toward the end of the century his advice was heeded, and that progressive farmers, at least, were housing both stock and fodder. At Nomini

Hall in Virginia, tutor Philip Fithian recorded renovations being made on the stable "to be convenient for holding Hay & fodder."<sup>131</sup> Landon Carter built a cow house, with stalls and a hay mow, as early as 1757,<sup>132</sup> and built another "new hay house" a decade later. For the most part, however, colonial husbandmen were regrettably lax in their use and storage of forage crops. Corn fodder was generally heaped up in the field, sometimes on a hollow rick, with only the dry tops to protect it from the weather. Some energetic farmers erected fences around the "fodder house," but many simply let their cattle tear it down in the course of the winter. Hay too was generally stacked in the field, though occasionally a farmer would take the trouble to cart it to the yard, or protect it under a temporary, shed-like, structure.<sup>133</sup>

#### Weather and Pests

As mentioned above, the chief enemies of forage crops were the unsuitable soil of the Chesapeake watershed and the climate. "We abound in all sorts of grain," wrote a Maryland man, "but can't make hay by reason of the excessive heats."<sup>134</sup> Not only did summers and prolonged winters effect the growth of the

various grasses, but heavy rains at the equinoxes could wash away or rot the seed. James Wilson recorded that much of the clover seed planted on his Maryland farm became swollen and burst after unusually wet weather in the spring of 1788, and George Washington complained of similar problems.<sup>135</sup> Winters that were too sunny or warm also had a negative effect on grass crops. Jared Eliot, a keen observer of American husbandry, remarked around 1750 that "English grass will not subsist without a Winter. In the Southern colonies the less Winter the less grass. In Virginia, North & South<sup>136</sup> Carolina, they have no English grass at all." Drought also had its consequences. In 1774 a severe dry season hit Virginia, causing Landon Carter to lament, "It is inconceivable how detrimental the dry weather has been to almost everything. The Pea vines, the fodder, merely burnt."<sup>137</sup> Similar bad weather also afflicted Washington's crops; one year the drought was so severe that he was forced to call in loans, and substitute wheat straw for fodder.<sup>138</sup> Of course, unusually harsh weather could be disastrous. On September 2, 1775, a tornado struck near Carter's estate, blowing way every hay stack and flattening the corn stalks which were to be used for fodder. So

devastated was the farm that he questioned whether it was really a blessing that the cattle were saved since there was nothing left to feed them.<sup>139</sup>

Animals and insects, as well as disease, also took their toll on grass crops. Washington described a fungus which attacked clover, called "Ret" or "Scab", which he believed was caused "by high winds & beating rains when the grass is in blossom...."<sup>140</sup> Moles and ant hills often disturbed the root systems, especially of newly sown grass, and muskrats, rats, crabs, and crayfish tunnelled through the carefully built dikes and irrigation canals of watered meadows.<sup>141</sup> Farmers complained of a "pea Bugg" which destroyed the crop by eating out the interior of the pea and destroying the husk, which was highly favored as cattle food. Peter Kalm observed that many farmers would not even attempt to grow peas or vetch because of this pest.<sup>142</sup> Ground worms also destroyed the tender roots of many grasses, and vetches were thought to be particularly susceptible to infestation by "worms, mites, and other little vermin."<sup>143</sup> Carefully tended crops were also sometimes destroyed by cattle, which dug up the turf or trampled the young grass, or by rats and mice which got into stacks and ate seeds and straw. Wild garlic not only

choked out the grasses but gave them a strong, unpleasant odor and flavor, which showed up in the dairy products of animals which grazed on it. Elder bushes were another troublesome weed, wrote John Bartram:

Our Elder is exceedingly troublesome in our meadows. The roots run under ground and spread much; and I do not know that mowing will ever kill it; and grubbing will kill little more than the mattock takes up, for if there is but a little bit of the root left in the ground, it will grow.(144)

Against these dangers farmers had little recourse but to fence and safely store their crops, trap some animals and shoo away others, or try to guard the grass against excessive dampness which encouraged fungus and irrigate when too dry.

#### Varieties

The following varieties of grass were grown in the colonial Chesapeake.  
145

Burnet: A perennial grass, providing good pasture, but a poorer quality hay. It was grown by men such as Carter or Washington, as an early experiment in grass culture, but did poorly in Virginia, where the soil was too acid. Charles Carroll in Maryland seemed to have a



better success with a variety called Rocques Burnet, which, he wrote, was "the best in standing the winter...."

Clover: After some experimentation, clover became one of the most successful of forage crops. Both red and white clovers were grown extensively, as well as yellow or "hop" clover, a larger, but less stable variety. In addition, other members of the Trefoil family, such as Bird's-foot trefoil, were occasionally grown. If sown early it could be cut up to three times a year, first in June, then later in the summer. It made passable hay, and was an excellent ground cover and soil replenisher. The seed was often difficult to obtain, and some found that the soil was not sweet enough for a really high yield, but over-all this was a most successful forage crop around the Chesapeake. Farmers disagreed about the relative merits of each variety. (Washington preferred red clover, while Jefferson and others thought the white variety most suited to the climate.)

Clover, which had a tendency to swell the stomachs of cattle, was not good pasture. English agriculturalists had often recommended mixing it with

rye grass so that it could be used as green food, but Bordley and other American farmers recommended against this.

Lucerne: English writers sang the praises of this European grass -- Miller believed that it was the ideal forage crop -- and its cultivation was consistently attempted in Maryland and Virginia, but it did not fare well. The mild winters suited it well enough but the hot summers, and stiff clay soil, did not. It could be cut green, put with other grasses for a mixed meadow, or dried for hay, though its chief advantage was the former use. Washington, Carroll, Jefferson, and Carter tried it on their large plantations, and Thomas Jones and his colleagues experimented in a more modest fashion, but all eventually gave up growing it. Only rarely was it as successful as it was on the family farm of Charles Dick who lived near Fredericksburg, Virginia. In 1757 he put in one-half acre of lucerne; for the next twenty years it supplied him with fodder enough to feed four horses and four cows. His method was to sow it in drills three feet apart, and to mow it frequently, up to nine times a year.

Rye Grass: Though somewhat similar in appearance, this imported grass was different from the native "rye

grass" of America. It was a thick, luxurious ground cover in England, often mixed with clover, which was cut young to make green food for cattle. It was also called ray grass, or darnel, in the colonies, and its seed was imported with high hopes by such men as Charles Carroll and George Washington. Like so many other European grasses, however, it did not flourish, and its culture was largely abandoned by the end of the eighteenth century.

Sainfoin: An excellent perennial grass, best suited to dry ground and chalky soil. One Spanish variety, well adapted to hot weather, was moderately successful around the Chesapeake water shed. Though it made a strong sweet hay, especially good food for horses, sainfoin was susceptible to weeds, and ill-suited for pasturage. Both its perennial nature and the difficulty of establishing it made it unsuitable for crop rotation, and as this became one of the major aspects of raising grass crops sainfoin waned in popularity. Like most of the other English grasses it gradually lost favor to timothy and clover.

Timothy: Though of English origin, this came to be regarded as a truly American grass. From about 1750 on

it was successfully planted on land that had not otherwise proven profitable for meadows. By the end of the century it was esteemed as the best hay for both horses and cattle, and in many areas was the only grass sown. It was grown as an annual, harvested twice in the summer, and generally planted in the fall. All of the major agriculturalists sowed timothy. Jefferson found it so productive that he could harvest two tons per acre, twice a year.

Vetch: A type of foliage pea, used as a ground cover, and turned in to enrich the soil. Its value was largely in its advantage to worn fields; it could, however, be fed to cattle either green or dry. Washington and Jefferson, Landon Carter and Charles Carroll all grew it.

Lesser Grasses: Also grown around the Chesapeake bay were the following:

Orchard (Guinea, Goose, or Duck) Grass: Tufty, fibrous rooted grasses, esteemed for their early growth, but yielding poor hay. These "spear" grasses were also valuable for lawns, and as a ground cover. They also provided important food for poultry - hence the variety of names.

Sedge: A wild marsh grass, yielding coarse, unnutritious hay but harvested in times of want by those not planting grass.

Succory: An English grass much esteemed by Jefferson, but faring poorly in most parts of the Chesapeake region. Washington was among those who tried, and gave up, its culture.

Lupine: Peter Kalm saw great fields of this grass growing near Delaware, but, though luxuriant, it was not favored by livestock.

Buffalo Grass: One of the Trefoils tried by Washington in the 1780s.

Ladies Mantle

Mountain Grass

Millett Cipurs Grass

Great Water Grass

Mousetail Grass

} Wild English grasses imported by Charles Carroll apparently with indifferent results.

### Crop Rotation

The advent of meadow culture was due chiefly to the need to furnish winter nourishment for livestock once the natural range had diminished. Grasses were difficult to raise, and it was this necessity only which prompted most farmers to trouble themselves with

planting grass and making hay. As the eighteenth century wore on, however, the cultivation of grasses and housing of stock came to have a much greater significance. There was a rising interest on both sides of the Atlantic in fertilization, and the use of fallow crops to replenish worn soils. Meadow culture became an integral part of these interests.

Like many of the agricultural innovations of the 1700s, crop rotation was not a new idea. Farmers had been setting aside fields to rest since Roman times, and Thomas Tusser, in the days of the Tudors, was well aware of the dangers of soil exhaustion:

Still crop upon crop many farmers do  
take,  
And reape little profit for  
greediness sake,  
Though breadcorne & drinkcorn such  
croppers do stand:  
A count person or brank, as a  
comfort to land.(146)

Nevertheless, American farmers, perhaps even more than their European counterparts, were negligent of the soil. The sheer abundance of land in North America invited carelessness; it was easier to move to fresh soil than to trouble oneself to replenish the old. This irresponsible attitude toward the land startled European travelers to the colonies and infuriated many

of those who hoped to see the American farmer show less interest in immediate profit, and greater long-term commitment to the soil. "Under the old habits of farming, if it may be called farming...", John Beale Bordley wrote, "land is continually losing strength...."<sup>147</sup> Another Maryland farmer exclaimed that "the Ignorance & Indolance of the Country people In managing Land is Amasing, they have no Method nor Notion, of using dung...."<sup>148</sup>

By the time of the American Revolution a number of agriculturalists had come forward to preach the gospel of crop rotation. Under this system, crops which depleted the soil, such as tobacco, corn, or wheat, were not planted in the same fields in successive years, but rotated to allow the soil to become replenished. Fallow, or ameliorating, crops were planted as part of the rotation. Eighteenth century naturalists advocated a number of different crops for this part of the rotation: turnips, peas or beans, grasses, potatoes, and even Jerusalem artichokes. Integral to this system was the plowing under of grass stubble after the fields were mown. Clover and vetch were thought to be particularly effective "green dressings."<sup>149</sup> Additional fertilizer was to be had by

gathering dung from the farms' livestock, and spreading it on the fields. It was this possibility which made agriculturalists so strongly in favor of housing animals, for, if kept in one place, with a straw or grass litter underfoot to absorb the droppings, the manure could be easily gathered and effectively used. The whole system, of grass replenishing the soil while it provided food for livestock, which in turn produced dung to further nourish the fields, made such a pleasing whole, that farmers such as Bordley became evangelical in their advocacy of grass and livestock husbandry. In 1787 he wrote: "why need farmers suffer their beasts to tread, harden and untill their soil, and waste grass and dung, by running in pastures, instead of being kept up, housed and fed....If no beasts were ever suffered to pasture there then scarcely would be any necessity for having cross fences -- What a saving of labor and wood." <sup>150</sup> New immigrants from England used to the crop rotation systems being established in that country, joined men such as Bordley in their advocacy of grass culture. One new settler, writing from Maryland in 1762, initiated crop rotation immediately upon his arrival, on the insistence of his brother who wrote from England:



The Method I would propose to you for the Improvement of your new Purchase would be for you to clear about Twenty Acres of your Wood land every year. The first 20 Acres that is cleared Plow it out and take one or two crops of corn of it then Summer fallow it give it five or six plowings and harrow it always betwixt plowings then sow it up with wheat and in the spring sow amongst your wheat some grass seeds and all the land you plow out for the first four years I would lay it down to grass then you will have in a few years plenty of Hay and pasturage for your cattle both wintere & summer but I hope you will take care to make proper conveniences for your cattle for the winter a Byer stable Honets & foulds for the breeding & saving of your Manure....(151)

Despite the notable efforts of such men, the American farmer was slow to put these systems into practice. The custom in Maryland and Virginia was to divide a farm into six fields. Two were planted in wheat or tobacco, two in corn, and two were left open to "rest." This later rotation, which Bordley called "spontaneous rubbish", was the most destructive of the three, through it was meant to aid the soil. Left open to erosion from wind and rain, leeching, and the adverse effects of weeds, such fields were generally less productive after such a "rest" than before. It was this "naked, ruinous, untilling Rest that must mar

all husbandry...," wrote an excited critic. "The Rest that through mere heredity, Habit we farmers delight in giving to our fields."<sup>152</sup> Another observer echoed these sentiments. "Unproductive fallows precede crops; after crops, the land is generally given up for a number of years to weeds and poor natural grasses, until it shall come into heart again; the husbandman, in the meanwhile, employing his labours upon his other field in succession."<sup>153</sup> However unproductive their labours might be, American farmers were set in their ways, and only a handful budged from the traditional methods before 1776. "The planters of America are wedded to their old methods used by their fathers and grandfathers," remarked a progressive farmer, who experimented with crop rotation in southern Maryland, "and entertain the most violent prejudices in their favor. This induced them to ridicule me for innovations and improvements, which in fact necessity compelled me to discover and adopt, to prevent the utter ruine, & entire loss of my whole crop."<sup>154</sup>

Like other aspects of grass culture, crop rotation was in the experimental stage during the eighteenth century. English and American agriculturalists had developed a number of theoretical systems, each

promoted with zeal, but for the most part farmers were left to themselves to establish an effective sequence of grain, grass, and root crops.

The most commonly advocated rotation was the Norfolk plan, a system which had been highly successful in that section of England. It was a six-year scheme. Clover was kept in the ground three years in succession, then planted with wheat, turnips, and barley in turn. By this system, Bordley noted, English farmers were harvesting thirty-two bushels of wheat to the acre, while their counterparts in Maryland brought in only six. He strongly suggested that American farmers subdivide their fields and follow this plan.<sup>155</sup>

He also advocated a modification of the Norfolk plan, made to include the raising of corn. By his eight year rotation clover would be kept for three years, followed by a year each of wheat, potatoes, corn, pease, and barley.<sup>156</sup> Bordley also believed that grass crops should be frequently rotated, to stir and replenish the soil. After some consideration, he decided that the best combination was a three-year system alternating rye, clover, and timothy. He cautioned that although these grasses were frequently found mixed, in rotation they should each be kept separate.<sup>157</sup>

Along the James River another successful rotation system was established. This was a four field rotation of fallow, corn, wheat and clover, the latter being turned under in the fall before lying at rest for a year. Bordley certainly did not approve of leaving a field thus idle, but the system seemed to work effectively at estates such as Shirley and Westover. <sup>158</sup>

Another successful experiment in crop rotation was conducted by George Logan, a planter in Loudoun County, Virginia. Logan was an early convert to the idea that a farmer's chief business was to preserve the soil's fertility, not to simply exploit the land. His plan was a nine-year rotation, for a farm specializing in stock and grain. Corn, potatoes, flax, two wheat crops, winter barley, buckwheat, timothy, and two clover crops were planted in sequence, producing enough fodder and grain to support fifty cattle. The cattle, he found, provided enough manure to fertilize one-ninth of his acreage. But the end of the rotation he was thus able to fertilize all of his land. <sup>159</sup>

Other farmers took notes on particularly successful rotations, even if they did not trouble to establish a definite system. Landon Carter swore by the advantage which peas gave to his land; he found

them beneficial to his soil, excellent "lay" for grain  
crops, and an important source of fodder. <sup>160</sup> George  
Washington was convinced that clover was the best  
predecessor for wheat. He also experimented with an  
eleven year cycle of oats, barley, buckwheat, Jerusalem  
artichokes, Irish potatoes, sweet potatoes, hominy,  
beans, peas, turnips, and carrots, but came to no  
conclusion about its benefits. <sup>161</sup> Others thought  
turnips unsuitable for the warm southern weather and  
promoted the use of pumpkins or potatoes instead. At  
the same time many trials were made of different  
fertilizers -- gypsum, manure, green dressings -- and a  
debate went on over the desirability of keeping a  
standing meadow in addition to the crops that were  
rotated. <sup>162</sup>

### Conclusion

The cultivation of forage crops in the colonial Chesapeake did not become widespread until after the American Revolution. Throughout most of the colonial period, most planters would not spend the time or labor necessary to raise improved pasturage or fodder crops. A few progressive planters experimented with forage crops in their field rotation systems. It was the desire for improved fallow rather than forage which gave the impetus for cultivating timothy and clover in this area.

With each private experiment and every enthusiastic pamphlet farmers learned more of the way to preserve the fertility of their land. Yet it was a slow process; widespread use of manure and crop rotations did not come about for many years. At the end of the century John Beale Bordley was still censoring his careless neighbors in Maryland, and proclaiming the virtues of dung. "These exhausting courses, we see, are continuously impoverishing our farms," he wrote sadly. "Too many farmers, therefore, incline to move to fresh lands, where they would  
163  
precisely act the same murderous part over again."

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