



## George Washington: Agricultural Innovator

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George Washington is best remembered, and rightly so, for his precedent-setting presidency and his successful generalship during the Revolutionary War, but he is also notable as a landowner and a farmer. Washington was an unusually astute and successful farmer, and this was not primarily a product of his prominent political position. His farms at Mount Vernon operated on the cutting edge of eighteenth century scientific agriculture, or “the new husbandry,” as he called it.<sup>1</sup> He saw severe problems in the way American farms operated, and sought to rectify them both on his own and across the new nation. He experimented with various fertilizers to compensate for Mount Vernon’s weak soil, with crop rotations, and with over one hundred different crops.<sup>2</sup> He also worked on new implements, such as a barrel seeder and a treading barn. Washington was an unusually curious and thoughtful farmer, and read extensively on new advances in agriculture. He derived the theory of crop rotations, fertilizers, and equipment from these books, but adapted them to his own needs.

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<sup>1</sup> Fusonie, Alan and Donna Jean. George Washington: Pioneer Farmer. Mount Vernon, Virginia: Mount Vernon Ladies Association, 1998. p. 12.

<sup>2</sup> Rees, James C. George Washington’s Leadership Lessons. Hoboken, New Jersey: John Wiley & Sons, Inc., 2007. p. 158.



Perhaps most importantly, Washington wanted to extend scientific agriculture to all American farms, which he felt were inefficient. He envisioned the United States as the “storehouse and granary for the world.”<sup>3</sup> Consequently his greatest impact on American agriculture was through his public policy, not through his own efforts at Mount Vernon.

### The Switch from Tobacco

Washington, like many Virginia farmers of his day, depended heavily on tobacco, but he had serious problems with the crop. In 1764 and 1765, he received “pitifully low” prices on his tobacco exports, lower than what some neighbors received. Tobacco prices had indeed fallen, but Washington puzzled over why his tobacco sold for less than what he saw as inferior products. He blamed British merchant Robert Cary, not himself, and tried other sellers, but had no more success. Meanwhile, his debt to Cary mounted, and he realized that he would need to find alternative cash crops.<sup>4</sup> “It appears pretty evident to me from the prices I have generally got for my Tobacco in London...that it only suits the Interest of a few particular Gentlemen to continue their consignments of this commodity to that place, while others shoud endeavour to substitute some other Article in place of Tobacco, and try their success therewith,”

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<sup>3</sup> To Marquis de Lafayette, 18 June 1788. *The Papers of George Washington Digital Edition*. Confederate Series [PGW:DE(Conf)]. Ed. W.W. Abbot and Dorothy Twohig. Charlottesville: University of Virginia Press, Rotunda, 2007. Volume 6, page 339.

<sup>4</sup> To Robert Cary & Company, 10 August 1764. PGW:DE, Colonial Series [Col]. Ed. W.W. Abbot. 7:323-326.



Washington told Cary in 1765.<sup>5</sup> Over the next few years, he began experimenting with other crops as a substitute in an attempt to make his farms profitable and eliminate his debt.

It is important to note that while Washington experimented with his crops, he was not alone in his transition away from tobacco. Tobacco was well-known to rapidly deplete soil, so it was only a sustainable crop if heavily fertilized or grown as part of a rotation.<sup>6</sup> Prices were declining, as Washington found, but Virginian tobacco still flooded the market. Hemp and wheat grew rapidly in popularity, and hemp briefly rivaled tobacco as the dominant crop in Virginia.<sup>7</sup> Food shortages in the West Indies and Europe boosted prices for wheat and corn, and both were grown in greater quantities after the midpoint of the eighteenth century. Indeed, this switch contributed to the growth of towns like nearby Alexandria, as they were markets for an increasing variety of farm products.<sup>8</sup> Washington switched away from tobacco earlier than most farmers, but he was hardly alone in doing so. Necessity drove the switch more than a grand vision. The Stamp Act and others designed to increase British revenues from the colonies made it more expensive to rely on imported goods. The tobacco economy relied on the availability of affordable British goods, but it became increasingly clear to Washington that he had to produce more at home, as English merchants squeezed the

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<sup>5</sup> GW to RC, 20 September 1765, PGW:DE(Col), 7:400.

<sup>6</sup> Fusonie, *Pioneer Farmer*, p. 8.

<sup>7</sup> Longmore, Paul K. *The Invention of George Washington*. Charlottesville, University Press of Virginia, 1999. p. 84.

<sup>8</sup> *Ibid*, pp. 84-85.



colonists for every penny they could. Thus, he would turn away from British products and grow a wider variety of crops and process them himself whenever possible.<sup>9</sup> Washington deserves credit for making the switch and making Mount Vernon profitable, but this was not an unusual action for farmers at the time.

Washington experimented with several other crops that he thought could be profitable without depleting the soil. The flax and hemp used for thread and cloth primarily came from Britain in the mid-18<sup>th</sup> century, shipped to America at great cost. Washington began to grow hemp and flax in the 1760s to see if it could be profitable. In 1763, Parliament passed “An Act for granting a Bounty upon the Importation of Hemp, and rough and undressed Flax, from his Majesty’s Colonies in America,” which incentivized American production of these products. In 1765 Washington wrote several letters asking how to receive this bounty, and what price he could expect to receive in port for the products.<sup>10</sup> His early experiments, he acknowledged, had been fairly unsuccessful, owing both to a drought and to his “inexperience in the management” of hemp and flax. Still, he pressed on, ordering more implements for the production of both products.<sup>11</sup> In the summer of 1766, Washington sent a first small shipment to James Gildart in Liverpool, to find out how much it would fetch, whether he could

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<sup>9</sup> Ibid, pp. 77-79.

<sup>10</sup>To Capel & Osgood Hanbury, 20 September 1765 PGW:DE(Col), 7:393-394; to James Gildart, 20 September 1765 PGW:DE(Col) 7:397; to RC, 20 September 1765, PGW:DE(Col), 7:400.

<sup>11</sup> Invoice to Robert Cary and Company, 20 September 1765, PGW:DE(Col), 7:400.



obtain the bounty, and how expensive the shipping would be.<sup>12</sup> Gildart found that the shipping costs were reasonable, and that he could easily obtain the bounty. That year Gildart wrote that he had never seen American hemp or flax in the British market,<sup>13</sup> but by 1767 the import was substantial. However, it was “so very ill dressed that the price has declined...If your farmers wont take more pains to Clean it I am Apprehensive our Officers will not Allow the bounty[. In short its not Marchenable.”<sup>14</sup> Though Washington did eventually improve the quality of production, neither product ever became profitable for him. Instead, he set up an operation to make clothing for his slaves from his own cloth, which saved money, and perhaps more importantly reduced his dependence on British goods.<sup>15</sup> As late as 1789, his friends still tried to dissuade him from his experiments with hemp and flax, but as President he continued to push for their production.<sup>16</sup>

Washington had much more success with the cultivation of wheat. In 1764, he sold 257 bushels of wheat in Alexandria, a trivial amount, but within three years he increased production by tenfold. By 1770, he sold almost twenty-five times as much as he had just six years before.<sup>17</sup> At first, Washington primarily grew common English red winter wheat, but he experimented with at least a dozen different varieties over his

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<sup>12</sup> To James Gildart, 21 July 1766, PGW:DE(Col), 7:455.

<sup>13</sup> To George Washington (GW), 22 April 1766, PGW:DE(Col), 7:435.

<sup>14</sup> To GW, 12 April 1768, PGW:DE(Col), 8:81.

<sup>15</sup> Longmore, *Invention*, p. 77

<sup>16</sup> Arthur Young to GW, 19 May 1789, PGW:DE Presidential Series (Pres) 2:343; GW to Alexander Hamilton, 14 October 1791, PGW:DE(Pres) 9:79.

<sup>17</sup> Longmore, *Invention*, p. 83.



lifetime. After the Revolution, he favored white wheat, and experimented heavily to attempt to breed the perfect strain.<sup>18</sup> He exchanged seeds with Thomas Jefferson and noted English agriculturist Arthur Young, among others. His experiments taught him that yellow-bearded wheat was the best at resisting pests, but that white wheat was higher quality and produced a better yield.<sup>19</sup> Washington's willingness to run fairly rigorous experiments to increase crop yield set him apart from many other farmers. During this period, wheat grew in popularity, but Washington was unusually adventurous, and as a result he was very successful.

Washington also experimented with oats, barley, corn, and many other food crops. Throughout his career as a farmer, he ran semi-scientific trials to see if various crops would take to Mount Vernon's fairly impoverished soil. In 1787, for example, he ran an experiment with the sowing of oats. He sowed two fields with Poland Oats and two more with George Town oats. For each strain, he sowed one field with two bushels to the acre and another with four.<sup>20</sup> He directed plantation manager George Augustine Washington to "Be careful to thresh the Oats wch grew in the experimental grounds by themselves, and in the manner directed, that the result may be precisely known."<sup>21</sup> Unfortunately, most of the letters from George Augustine have been lost, so the results

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<sup>18</sup> Diary entry, 14 April 1760. PGW:DE(Col), 6:266-267.

<sup>19</sup> GW to John Beale Bordley, 17 August 1788, PGW:DE(Conf) 6:450.

<sup>20</sup> GW Diary Entry, 31 March 1787. PGW:DE(Conf) 5:125-126.

<sup>21</sup> 24 July 1787. PGW:DE(Conf) 5:270.



of the experiment are unknown. Still, it demonstrates Washington's determination to use the best possible seeds.

With his vastly enhanced supply of wheat, Washington increasingly profited from processing it into flour, and later into liquor. He rebuilt and improved his mill at Dogue Run in 1770 and 1771, lengthening the run and enlarging its capacity.<sup>22</sup> Before the improvements, the mill had been inefficient because "She fails by want of Water," as miller William A. Poole wrote.<sup>23</sup> To decrease shipping costs, he positioned the mill at the intersection of the tidal Dogue Creek and Dogue Run. The latter provided the power source for the mill, while flat-bottomed boats took the finished flour to the mouth of the creek, where it was loaded onto larger ships.<sup>24</sup> The new mill's wheel measured sixteen feet in diameter. With this expanded capacity, Washington processed wheat from other local farmers in exchange for one eighth of the amount the flour sold for.<sup>25</sup> Washington became one of the first adopters of Oliver Evans's revolutionary mill design, installing it in 1791, four years before Evans published a book about it.<sup>26</sup> Until his death, Washington continued to improve his mill, building a new race in 1797 to further decrease water-flow issues.<sup>27</sup> He finally solved the water flow issue once and for all in

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<sup>22</sup> Lund Washington to GW, 12 May 1771, PGW:DE(Col) 8:468; GW to Charles Washington, 25 January 1771, PGW:DE(Col) 8:430.

<sup>23</sup> 9 July 1758. PGW:DE(Col) 5:274.

<sup>24</sup> Haworth, Paul Leland. George Washington: Farmer. Indianapolis: The Bobbs-Merrill Company, 1915. p. 98.

<sup>25</sup> Diary entry, 22 March 1770, PGW:DE(Col) 8:222.

<sup>26</sup> Fusonie, Pioneer Farmer, p. 40.

<sup>27</sup> GW to James Anderson, 18 June 1797, PGW:DE Retirement series (Ret), ed. W.W. Abbot, 1:191-195.



1799 with the construction of a horse-powered mill in 1799, which could operate during dry times.<sup>28</sup>

Under the G. Washington brand, he sold superfine, fine, and middling flour, plus coarse “ship or Bisquet-stuff,” which could be used to make hardtack biscuits for sailors.<sup>29</sup> The “middling flour” was the cheapest to make, but the most difficult to sell.<sup>30</sup> Sellers regarded Washington’s fine and superfine flour to be high quality, and Norfolk merchant Thomas Newton wrote Washington that his flour “has the preference of any at this market.” Still, American flour production exploded and began to flood the market at the same time, and Newton had occasionally difficulty selling it.<sup>31</sup> Nevertheless, with wheat Washington found the success and reputation for quality that he had lacked as a tobacco farmer.

Near the end of Washington’s life, his farm manager, James Anderson<sup>32</sup> convinced him to build a distillery to turn grain into whiskey. Distilling became extremely popular during the period because whiskey was in great demand and could be converted into cash more easily than flour. Farmers found it much easier to transport whiskey than wheat or flour of the same value. Washington wrote Anderson in 1797 that distilling “is a business I am entirely unacquainted with; but from your knowledge

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<sup>28</sup> GW to William Booker, 3 March 1799, PGW:DE(Ret), 3:404-405.

<sup>29</sup> GW to Thomas Newton, Jr., 12 February 1773, PGW:DE(Col) 9:175.

<sup>30</sup> Thomas Newton Jr. to GW, 30 June 1773, PGW:DE(Col) 9:252.

<sup>31</sup> Thomas Newton Jr. to GW, 22 March 1773, PGW:DE(Col) 9:203.

<sup>32</sup> Not to be confused with the Scottish agriculturalist James Anderson with whom Washington corresponded during the same period.



of it and from the confidence you have in the profit to be derived from the establishment, I am disposed to enter upon one.”<sup>33</sup> Construction began in the fall of that year, and by early 1798 the stills were in operation. Distilling required substantial start-up capital, though, and Washington complained that it “has cost me a considerable Sum already, but I find these expenditures are but a small part of the advances I must make before I shall receive any return for them.”<sup>34</sup> However, once production began, the whiskey sold well, and Washington wrote shortly before his death that “the demand for this article (in these parts) is brisk.”<sup>35</sup> Like many other farmers of his day, Washington had success in the whiskey business. His distillery differed from others only in scale.

Washington’s steadiest source of income proved to be the abundant fisheries of the Potomac River. He owned about ten miles of its shore, and he quickly realized that the river was “well supplied with various kinds of fish at all Seasons of the year; and in the Spring with the greatest profusion of Shad, Herring, Bass, Carp, Perch, Sturgeon &ca. Several valuable fisheries appertain to the estate; the whole shore in short is one entire fishery.”<sup>36</sup> Washington had his slaves stretch enormous nets in the river – hundreds of feet long and as much as twelve feet deep – during the peak of the best runs. They then salted and packed the fish in barrels, some being used as food for

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<sup>33</sup> 18 June 1797. PGW:DE(Ret) 1:191-195.

<sup>34</sup> To Robert Lewis, 26 January 1798. PGW:DE(Ret) 2:47.

<sup>35</sup> To William Augustine Washington, 29 October 1799, PGW:DE(Ret) 4:373.

<sup>36</sup> To Arthur Young, 12 December 1793. John C. Fitzpatrick, ed. The Writings of George Washington. Washington, DC: United States Government Printing Office, 1931-1944. Volume 33, p. 176.



Mount Vernon's slaves and others sold in Alexandria or the West Indies. This fishery turned a consistent profit, and by the 1790s it was Mount Vernon's most profitable enterprise.<sup>37</sup>

Washington also turned to livestock to bring in new revenue. Like many other farmers, he raised pigs and cows, although his ham stood out for its remarkably high quality. In addition to those he raised sheep, a fairly uncommon practice in Virginia at the time. Already in 1758 he had a flock of over 100, which increased to 205 in 1762.<sup>38</sup> Sheep did well at Mount Vernon, and Washington valued their meat, wool, and hides. His flock may well have continued to grow, but it stagnated during his long absence due to the Revolutionary War. Upon his return, Washington read of the achievements of English breeder Robert Bakewell, whose estate was described in a book by British agriculturalist Arthur Young. British statutes prohibited the export of Bakewell's lambs, but Washington did buy lambs that descended from Bakewells.<sup>39</sup> Although Washington's flock had many problems with disease and predators, particularly while he was away, he did have some success. In 1789 he sent a sample of his wool to Young, who reported that "it resembles very much our best Kentish and Northampton wool."<sup>40</sup>

### Methods to Increase Yield

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<sup>37</sup> Fusonie, *Pioneer Farmer*, p. 47.

<sup>38</sup> *Ibid.*, p. 28.

<sup>39</sup> GW to Arthur Young, 18 June 1792 – 21 June 1792, PGW:DE(Pres) 10:460-466.

<sup>40</sup> 25 January 1791. PGW:DE(Pres) 7:284.



As he transitioned his operation from tobacco to a more diverse range of crops, Washington experimented with various ways to increase the productivity of his land. The principal methods were fertilizer and crop rotation. Washington experimented with a large variety of fertilizers, and tried many different combinations of crops to maximize productivity. To some extent, he applied theories devised by agriculturists like Young, but he also did his own research to determine which methods worked most effectively at Mount Vernon.

Because of the poor soil quality at Mount Vernon, Washington found that he had no choice but to fertilize. He most often used mud from the Potomac or from nearby creeks, but obtaining it was labor-intensive and difficult. He considered buying a horse-powered dredge called the “Hippopotamus,” but concluded that he would have to go too far out into the shallow river for horse power to work.<sup>41</sup> When in 1785 a large shipment of plaster of Paris intended for Alexandria ended up at Mount Vernon, Washington decided to buy it for himself and try it as a fertilizer.<sup>42</sup> He found that it was effective, and sprinkled it on his garden thereafter. However, it was too expensive for

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<sup>41</sup> Haworth, *GW: Farmer*, p. 103.

<sup>42</sup> GW to Matthew Campbell, 22 January 1785, PGW:DE(Conf) 2:278-279.



large-scale use.<sup>43</sup> Washington also tried mud from various streams and swamps, and different types of Potomac mud.<sup>44</sup>

Washington carefully tested various fertilizers to determine which had the greatest effect. For example, in 1760 he ran a major experiment with ten different varieties of compost to see which performed the best with wheat, barley, and oats. Six boxes contained different types of dirt, sand, mud, and clay. One contained horse dung, another sheep dung, and still another cow dung. The remaining box contained “Black Mould taken out of the Pocason on the Creek side.” Washington carefully made the experiment scientific by controlling other variables: he watered them equally at the same time with water from the same source, planted the same amount of each crop in a uniform pattern, and planted the seeds at equal depth.<sup>45</sup> When he checked on the boxes later, he found that “The two Grains in No. 8 were I think rather the strongest, but upon the whole No. 9 was the best.”<sup>46</sup> The eighth box used sheep dung, and the ninth used the black mold. Later that year, Washington began a similar experiment with seven varieties of mud, but the results of this test are unknown.<sup>47</sup>

Washington hailed manure as the most important and effective fertilizer, once writing that a good farmer was one who, “Midas like...can convert everything he

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<sup>43</sup> Diary entry, 9 March 1785 PGW:DE(Conf) 2:99-100; GW to Edward Carrington, 2 December 1799, PGW:DE(Ret) 4:437.

<sup>44</sup> Diary entry 14 April 1760, PGW:DE (Col) 6:266-267; diary entry 22 May 1760, PGW:DE (Col) 6:282-283; diary entry 8 April 1760, PGW:DE (Col) 6:265.

<sup>45</sup> Diary entry, 14 April 1760, PGW, PGW:DE (Col) 6:266-267.

<sup>46</sup> Diary entry, 1 May 1760, PGW, PGW:DE (Col) 6:275.

<sup>47</sup> Diary entry, 22 May 1760, PGW:DE (Col) 6:282-283.



touches into manure, as the first transmutation towards Gold.”<sup>48</sup> In 1796 he directed his farmhands to build a “Depository for Dung” to collect manure and other refuse to use as compost. The design of the depository resembles an illustration in Thomas Hale’s A Compleat Body of Husbandry (1758-1759), a book Washington had purchased years earlier. In his commitment to manure as a fertilizer, Washington echoed John Spurrier, author of The Practical Farmer (1793), another book Washington owned.<sup>49</sup> Washington eagerly incorporated new ideas into Mount Vernon’s operation.

Washington considered proper crop rotations to be the most important aspect of successful husbandry.<sup>50</sup> He ran an ongoing experiment to determine which crop would be best-suited to grow between the rows of corn. The ideal plant would be one that enriched the soil and could be sold or eaten. In 1788 he reported that “My Cabbages between the Corn rows have failed entirely. They will not do in this mode of cultivation – and for that reason I am disposed to discard them altogether.” Similarly, “I have had demonstrative proof...that Pease exhaust...the Soil, considerably,” and he ceased to use them. However, Washington found that carrots and potatoes “enrich the Soil,” and were the best solution.<sup>51</sup> He found that “the quantity of Potatoes will at least

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<sup>48</sup> To George William Fairfax, 30 June 1785, PGW:DE(Conf) 2:90.

<sup>49</sup> Fusonie, Pioneer Farmer, p. 24.

<sup>50</sup> *Ibid.*, p. 15.

<sup>51</sup> To Richard Peters, 7 September 1788, PGW:DE(Conf) 6:504-506.



quadruple the quantity of Corn," which seems exaggerated, but still demonstrates the success of that particular pairing.<sup>52</sup>

Another question was which crop would most effectively prepare the soil for the planting of wheat and corn. In Washington's rotation plan, the seven fields at Dogue Run were put on staggered seven-year cycles. Under this plan, the field produced corn and potatoes in the first year, wheat in the second, buckwheat (which he plowed under as manure) in the third, wheat again in the fourth, and then three years of clover or grass. However with just three cash crops produced per seven-year cycle, Washington wrote, "the produce of the sale of the Crops is small, unless encreased by improving the state of the fields." This was just one of at least six rotation plans he experimented with in the 1790s as he tried to find the most efficient combination for crops.<sup>53</sup>

Washington based his rotations on several sources, and then modified them to suit his particular needs. He heavily annotated Henry Home's book The Gentleman Farmer (1776), which sketched out plans for a six-year rotation of crops. His friend John Beale Bordley, a farmer on Maryland's Eastern Shore, wrote extensively on crop rotations in his book Rotation of Crops (1784), proposing an eight-field system.<sup>54</sup> Washington corresponded with Bordley about the subject, and sent him a detailed

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<sup>52</sup> To John Beale Bordley, 17 August 1788, PGW:DE(Conf) 6:450.

<sup>53</sup> Haworth, GW: Farmer, p. 124.

<sup>54</sup> Fusonie, Pioneer Farmer, p. 16.



description of his own rotation system and asked for advice.<sup>55</sup> Washington also corresponded with Arthur Young, a British agriculturist, who advised him that the “course you mention...with a very little alteration might be converted into a very good one.”<sup>56</sup> With help from other like-minded farmers, Washington honed his rotation to maximize profit without sacrificing soil quality.

### New Machinery

Washington, always curious about new advances in farm equipment, ordered new machines as soon as he heard of them. When no suitable machine was available, or when he was dissatisfied with the results he was getting, he tried to improve things himself. It is no surprise that a man so interested in scientific agriculture should be fascinated by technology as well. Washington’s innovations were minor, but they still show his high level of engagement in the operation of his farm.

When he switched from tobacco to wheat, Washington found that he needed a different type of equipment, and he set about ordering the latest innovations. He acquired the latest plows from England, and in 1786 Arthur Young sent him a plow of a new design.<sup>57</sup> In the 1760s and early 1770s he ordered wheat sieves and corn scythes from Robert Cary & Company in England, but his own carpenters would make these tools.<sup>58</sup> Washington placed great importance in farm

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<sup>55</sup> 17 August 1788, PGW:DE(Conf) 6:450.

<sup>56</sup> 1 July 1788, PGW:DE(Conf) 6:369.

<sup>57</sup> GW to Arthur Young, 15 November 1786, PGW:DE(Conf) 4:372.

<sup>58</sup> 15 November 1762, PGW:DE(Col) 7:163; 18 July 1771, PGW:DE(Col) 7:508-511.



implements, writing in 1793 that he never spared “furnishing my Farms with any, and every kind of Tool and implement that is calculated to do good and neat work...I shall begrudge no reasonable expense that will contribute to the improvement and neatness of my farms.”<sup>59</sup>

When he could not purchase what he needed, he set out to make it himself. In early March of 1760, Washington wrote in his dairy that “the Plows run very badly,” and over the next week he had continual trouble with his plowing.<sup>60</sup> To resolve this, Washington and his smith, Peter, worked to “make a plow after a new model—partly of my own contriving.”<sup>61</sup> “Spent the greatest part of the day in making a new plow of my own Invention,” he reported the next week.<sup>62</sup> In April, he wrote that he had “Made another Plow the same as my former excepting that it has two Eyes and the other one.”<sup>63</sup> The designs of this plow have not been found, but this anecdote illustrates Washington’s inventiveness and his deep involvement in the operations of Mount Vernon.

Decades later, he once again found himself dissatisfied with existing plowing equipment. At the time, farm workers seeded by hand and then covered the seed with a hoe, a drag, or a harrow. This was time-consuming and difficult work, and Washington felt that it could be replaced by a farm machine capable of performing these tasks simultaneously.<sup>64</sup> Young described such machines in his *Annals of Agriculture* and Henry Duhamel du Monceau did so in *A Practical Treatise of Husbandry* (1762), another book Washington owned, and Washington

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<sup>59</sup> To William Pearce, 6 October 1793, *Writings* 33:111.

<sup>60</sup> Diary entry, 5 March 1760, PGW:DE(Col) 6:250; diary entry 15 March 1760., PGW:DE(Col) 6:254.

<sup>61</sup> Diary entry, 19 March 1760, PGW:DE(Col) 6:255.

<sup>62</sup> Diary entry, 26 March 1760, PGW:DE(Col) 6:257.

<sup>63</sup> Diary entry, 5 April 1760, PGW:DE(Col) 6:263.

<sup>64</sup> Fusonie, *Pioneer Farmer*, p. 18.



likely based his design on these.<sup>65</sup> He “fixed a roller to the tale of my drill plow, and a bush harrow between it & the barrel.”<sup>66</sup> This enabled the plow to disperse seeds in even rows and cover them in one pass. By changing the distance between the holes in the barrel, it could seed any grain. He tinkered with the plow throughout the summer and fall, and in December presented one to his friend Theodorick Bland as a gift, writing that he was “certain you will find it equal to your most sanguine expectation for Indian Corn, wheat, Barley, Pease or any other tolerably round grain that you may wish to sow.”<sup>67</sup> Washington also sent one of his plows to Young, who reported that they were “excellent” and “they do their business perfectly to my wish.”<sup>68</sup>

As Washington’s wheat production grew, he found that he needed to greatly expand his threshing capacity. At that time, two methods existed for threshing, meaning to separate wheat grains from the stalk. In the first, slaves or other laborers beat the wheat with a wooden implement called a flail, knocking the grain to the ground. In the second method, called treading, workers laid the wheat on the ground outside and drove horses over it, the hoofs imitating the flails.<sup>69</sup> The former method was slow and labor-intensive; the latter faster but “hurtful to horses [and] filthy to the Wheat,” as Washington wrote.<sup>70</sup> In the 1790s, after he had expanded his mill, Washington found that his production of flour was being held up by the slow threshing process.<sup>71</sup>

Around this time, English and American inventors thought up new threshing machines that made the process more efficient. An article by William Winlaw appeared

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<sup>65</sup> Ibid., p. 17.

<sup>66</sup> Diary, 26 July 1786, PGW:DE(Conf) 4:16.

<sup>67</sup> 28 December 1786, PGW:DE(Conf) 4:484-485.

<sup>68</sup> 1 February 1787, PGW:DE(Conf) 5:3-6.

<sup>69</sup> Fusonie, *Pioneer Farmer*, pp. 19-20.

<sup>70</sup> Diary entry, 22 January 1790, PGW:DE(Pres) 5:12-13.

<sup>71</sup> Fusonie, *Pioneer Farmer*, pp. 19-20.



in the sixth volume of Arthur Young's *Annals* about his new threshing machine.

Washington witnessed this machine in use at Baron von Poellnitz's farm on Manhattan Island in 1790, and found that "Upon the whole it appears to be an easier, more expeditious and much cleaner way of getting out Grain than by the usual mode of threshing."<sup>72</sup> He and Thomas Jefferson visited the farm of Samuel Powell in 1791 to see another machine, this one invented by Alexander Anderson.<sup>73</sup> These machines threshed more effectively than existing methods, but required a substantial investment, and Washington waited until after his Presidency to purchase one. In 1797 he wrote William Booker, a Richmond farmer who had invented a new threshing machine based on an earlier Scottish model that Washington had liked. Washington asked Booker to build him one of his machines, and that summer Booker traveled to Mount Vernon to do so.<sup>74</sup> The machine quickly broke down, however, and Booker returned in 1798 and 1799 to repair the machine.<sup>75</sup> One machine still would not come close to satisfying the threshing needs of all of Mount Vernon, however, and Washington continued to use several methods of threshing.

One of these methods was unique to Mount Vernon, a treading barn of Washington's own invention. Since outdoor treading dirtied the wheat and was vulnerable to the weather, Washington decided to build an indoor treading barn. This

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<sup>72</sup> Diary entry, 22 January 1790, PGW:DE(Pres) 5:12-13.

<sup>73</sup> GW to Thomas Jefferson, 21 August 1791, PGW:DE(Pres) 8:448.

<sup>74</sup> GW to William Booker, 26 June 1797, PGW:DE(Ret) 1:216.

<sup>75</sup> GW to William Booker, 15 April 1798, PGW:DE(Ret) 2:238; 3 March 1799, PGW:DE(Ret) 3:405.



appears to be a completely original innovation, as there is no record of the existence of other such barns.<sup>76</sup> In a letter to farm manager Anthony Whitting from October of 1792, Washington described in detail a plan for a treading barn at Dogue Run Farm and provided a sketch. The barn would have sixteen sides so that the horses ran continually (horses do not urinate while they are running), and be two stories tall. Between the boards large there would be gaps large enough for the grain to fall through, but small enough to keep the straw out.<sup>77</sup> Construction took longer than expected and faced many problems, and it is unknown exactly how well the barn functioned, but it did remain standing well into the nineteenth century.<sup>78</sup> As one portion of his threshing operation, it seems to have been adequate, but it was not successful enough to be adopted by other farmers. By that time, mechanical threshing machines could be made more efficient for less cost. Washington's treading barn, costly to build and less efficient than the new machines, quickly became obsolete.

In addition to powered machinery, Washington sought the very best in animal power. As was his wont, he experimented with several breeds of horses and carefully bred his own. More interestingly, he vocally promoted the use of mules, the offspring of a mare and a male donkey. Washington believed that mules were a superior work animal to horses and oxen, and in 1784 he wrote to Robert Townsend Hooe of

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<sup>76</sup> Fusonie, *Pioneer Farmer*, p. 20.

<sup>77</sup> GW to Anthony Whitting, 28 October 1792, PGW:DE(Pres) 11:273-277.

<sup>78</sup> Fusonie, *Pioneer Farmer*, p. 20.



Alexandria, who planned to send a ship to Spain, to ask if he could bring back a Spanish jackass, considered the best in the world.<sup>79</sup> King Charles III of Spain, learning of his interest, arranged for two Spanish jacks to be shipped to Washington as a gift. One of the jacks died on the voyage, but the other finally arrived at Mount Vernon eleven months later, in December of 1785. Washington named the jack “Royal Gift” to honor the King. The next year, Lafayette brought Washington three jackasses, one male and two females, from the Island of Malta.

Washington began breeding the jacks with his mares, and quickly found that the mules were very useful. He put out an advertisement encouraging farmers to bring their mares to Mount Vernon to mate with his jacks. “Their great strength, longevity, hardiness and cheap support, give them a preference of horses that is scarcely to be imagined,” he wrote.<sup>80</sup> This was more than mere rhetoric; Washington truly believed that mules were superior. In 1785, he had no mules and 130 horses, but in 1799, he had 58 mules and just 25 horses. He sent Royal Gift on a tour of the south for shows and arranged breedings to try to stir up interest in mules in other parts of the country. His efforts apparently paid off, for by 1880 America had nearly two million mules.<sup>81</sup>

### A National Vision

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<sup>79</sup> 18 July 1784, PGW:DE(Conf) 2:1-2.

<sup>80</sup> Advertisement, 23 February 1786, PGW:DE(Conf) 3:571-572.

<sup>81</sup> Fusonie, *Pioneer Farmer*, pp. 35-36.



Washington thought that the United States had great potential for agriculture, but that farming practices must make fundamental reforms to realize this vision. America could be the “storehouse and granary For the world,” he wrote to Marquis de Lafayette in 1788.<sup>82</sup> In the same year, in a letter to Irish politician Edward Newenham, he wrote that “We have an almost unbounded territory whose natural advantages for agriculture & commerce equal those of any on the globe.”<sup>83</sup> Indeed, “It is on that resource it must depend essentially for its prosperity.”<sup>84</sup> Four years later, he confidently told Newenham that “our agriculture, commerce & navigation are in a flourishing state.”<sup>85</sup>

Yet, for America to succeed as an agricultural nation, Washington thought that improvements would have to be made to existing methods. “The system of Agriculture (if the epithet of system can be applied to it) which is in use in this part of the United States, is as unproductive to the practitioners as it is ruinous to the landholders. Yet it is pertinaciously adhered to,” he wrote in 1786.<sup>86</sup> His passion for the new husbandry is obvious from the way he ran his own farm, but he also wished to see it extended to the rest of America’s farmers. He felt that it was his duty, and the duty of other gentleman farmers, to work to improve agricultural techniques so that they could be extended to

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<sup>82</sup> 18 June 1788, PGW:DE(Conf) 6:338.

<sup>83</sup> 29 August 1788, PGW:DE(Conf) 6:486-489.

<sup>84</sup> To Edward Newenham, 2 March 1789, PGW:DE(Pres) 1:355.

<sup>85</sup> 20 October 1792, PGW:DE(Pres) 11:246-247.

<sup>86</sup> To Arthur Young, 6 August, PGW:DE(Conf) 4:196.



others with less financial flexibility. “Experiments must be made,” he wrote to John Beale Bordley in 1788, “and the practice (of such of them as are useful) must be introduced by Gentlemen who have leisure and abilities to devise and wherewithal to hazard something. The common farmer will not depart from the old road ’till the new one is made so plain and easy that he is sure it cannot be mistaken, and that it will lead him directly to his object.”<sup>87</sup>

Washington believed that “no Country has carried the improvment of Land & the benefits of Agriculture to greater perfection than England,” and through his wide reading and correspondence with Englishmen such as Young he hoped to bring the English system to America.<sup>88</sup> The main difference in approach, he wrote to Young, was “that the aim of the farmers in this Country (if they can be called farmers) is not to make the most they can from the land, which is, or has been cheap, but the most of the labour, which is dear.” This meant that “much ground has been *scratched* over & none cultivated or improved as it ought to have been.”<sup>89</sup> When the land was exhausted, the farmer was faced with the choice of leaving the land and moving west, or to “substitute quantity for quality, in order to raise something.”<sup>90</sup> Instead, Washington thought that American farmers should try to make the most of their land with the new husbandry

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<sup>87</sup> 17 August 1788, PGW:DE(Conf) 6:450.

<sup>88</sup> To George William Fairfax, 30 June 1785, PGW:DE(Conf) 3:89.

<sup>89</sup> 5 December 1791. PGW:DE(Pres) 9:256.

<sup>90</sup> To Arthur Young, 18 June 1792 – 21 June 1792, PGW:DE(Pres) 10:460-466.



techniques, increasing yield and profit. “Nothing,” he wrote, “would contribute more to the welfare of these States, than the proper management of our Lands.”<sup>91</sup>

To promote this idea, Washington became involved in the Philadelphia Society for Promoting Agriculture. Founded by Bordley and Philadelphia businessman John Cadwalader in 1785, the Society aimed to address “our great inferiority” in farming methods and the need for “more skillful and fortunate management.”<sup>92</sup> Washington wrote that the Society “promises extensive usefulness, if it is prosecuted with spirit—I wish most sincerely that every State in the Union would institute similar ones; and that these Societies would corrispond fully, & freely with each other; & communicate all useful discoveries founded on practice...to the public.”<sup>93</sup> He attended a meeting of the Society in 1787 and presented them with six volumes of Arthur Young’s *Annals of Agriculture*. Membership expanded to include farmers from eight states by 1789; Washington himself held an honorary membership.<sup>94</sup> The Agricultural Society went on to publish articles, books and pamphlets promoting new agricultural methods. Washington also became an honorary member of a similar society in South Carolina.<sup>95</sup>

As President, Washington pressed Congress to support agricultural improvement, but made little progress with it. In his undelivered first inaugural

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<sup>91</sup> To William Drayton, 25 March 1786, PGW:DE(Conf): 3:606.

<sup>92</sup> Fusonie, *Pioneer Farmer*, p. 51.

<sup>93</sup> To James Warren, 7 October 1785, PGW:DE(Conf) 3:299-300.

<sup>94</sup> Fusonie, *Pioneer Farmer*, pp. 51-53.

<sup>95</sup> GW to William Drayton, 25 March 1786, PGW:DE(Conf) 3:606.



address, he called for a ten-fold increase in the domestic production of flax, cotton and hemp. He also encouraged farmers to adopt “machines for multiplying the effects of labour” to increase production.<sup>96</sup> On the advice of Scottish agriculturalist John Sinclair, who also served as a member of the British Parliament, he recommended that Congress create a National Board of Agriculture to collect and disseminate information about agriculture.<sup>97</sup> Congress failed to act on this, however. Washington wrote Sinclair that he thought “it highly probable that next Session will bring this matter to maturity,” but this did not materialize.<sup>98</sup> In fact, such an institution was not created until 1862, when Abraham Lincoln established the Department of Agriculture.<sup>99</sup> Washington saw the “importance of National encouragement to Agriculture,” and he promoted this as President.<sup>100</sup> This paid off in long term, as America eventually embraced scientific agriculture and became one of the world’s foremost food producers.

Washington was committed to improving agricultural techniques at his own farm at Mount Vernon and throughout America. His own discoveries and innovations are fairly limited – his treading barn was never copied and his improved plow never widely adopted, and he was hardly alone in his switch from tobacco to wheat – but his influence was amplified by his powerful political position. He effectively used this

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<sup>96</sup> PGW (Pres) 2:171.

<sup>97</sup> GW to Alexander Hamilton, 2 November 1796, *Writings* 35:253.

<sup>98</sup> 6 March 1797. PGW:DE(Ret) 1:14.

<sup>99</sup> Fusonie, *Pioneer Farmer*, p. 55.

<sup>100</sup> GW to John Sinclair, 20 January 1799, PGW:DE(Ret) 3:326.



position to increase awareness of mules as draft animals, for example. He corresponded with the leading agriculturists in England and America alike and disseminated their ideas as widely as he could. More than any other Founding Father, he believed that American agriculture needed to be modernized in order to be the foundation of the economy. It is clear that Washington was truly and deeply committed to agricultural progress, and that he saw it as essential to the future success of the United States.



## Bibliography

Abbot, W.W., and Dorothy Twohig, eds. The Papers of George Washington.

Confederation Series. Charlottesville : University Press of Virginia, 1992.

Abbot, W.W., ed. The Papers of George Washington. Colonial Series. Charlottesville :

University Press of Virginia, 1983.

Abbot, W.W., ed. The Papers of George Washington. Presidential Series. Charlottesville

: University Press of Virginia, 1987.

Crackel, Theodore J., ed. The Papers of George Washington Digital Edition,

Charlottesville: University of Virginia Press, Rotunda, 2007.

Fitzpatrick, John C., ed. The Writings of George Washington. Washington, DC: United

States Government Printing Office, 1931-1944.

Fusonie, Alan and Donna Jean. George Washington: Pioneer Farmer. Mount Vernon,

Virginia: Mount Vernon Ladies Association, 1998.

Haworth, Paul Leland. George Washington: Farmer. Indianapolis: The Bobbs-Merrill

Company, 1915.

Longmore, Paul K. The Invention of George Washington. Charlottesville, University

Press of Virginia, 1999.

Rees, James C. George Washington's Leadership Lessons. Hoboken, New Jersey: John

Wiley & Sons, Inc., 2007.



Twohig, Dorothy, ed. The Papers of George Washington. Retirement Series.

Charlottesville : University Press of Virginia, 1998-1999.