

IN THE FIELD

The history and survival of traditional heirloom vegetable varieties in the southern Appalachian Mountains of western North Carolina

James R. Veteto

Laboratories of Agricultural and Natural Resource Anthropology and Ethnoecology and Biodiversity, Department of Anthropology, The University of Georgia, Athens, Georgia, USA

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Abstract. Southern Appalachia is unique among agroecological regions of the American South because of the diverse environmental conditions caused by its mountain ecology, the geographic and commercial isolation of the region, and the relative cultural autonomy of the people that live there. Those three criteria, combined with a rich agricultural history and the continuance of the homegardening tradition, make southern Appalachia an area of relatively high crop biodiversity in America. This study investigated the history and survival of traditional heirloom vegetable crops in western North Carolina and documented 134 heirloom varieties that were still being grown. I conducted interviews with 26 individuals from 12 counties in western North Carolina. I used a snowball sampling method to identify individuals or communities that maintained heirloom vegetable varieties, and used the “memory banking” of farmers’ knowledge as a strategy to complement the gathering of seed specimens. Most of the varieties were grown and saved by home gardeners; beans were the most numerous. Results indicate that usually only one or two individuals in a community maintained significant numbers of heirloom varieties and that many communities have lost their heirloom vegetable heritage altogether. The decline of the farming population combined with a lack of cultural continuance in family seed-saving traditions threatens the ability of communities to maintain crop biodiversity. Some of the cultivars may represent the last (small) populations of endangered varieties.

Key words: Crop biodiversity, Southern Appalachia, Western North Carolina, Heirloom vegetable varieties, Homegardens

James R. Veteto is currently a PhD student in Ecological and Environmental Anthropology at the University of Georgia. He has a BA in anthropology and English from the University of Georgia (1998) and an MA in Appalachian studies with a concentration in sustainable development from Appalachian State University (2005). He is interested in agricultural anthropology, ethnoecology, ethnobotany, agrobiodiversity, agroecology, and origins of agriculture. His work focuses on the documentation and preservation of southern Appalachian heirloom vegetable varieties. He has also worked as an organic farmer and garden educator.

Introduction

America has lost an estimated 97% of the vegetable varieties that were commercially available in this country in 1903 (Fowler and Mooney, 1990). Moreover, the rate of extinction of traditional heirloom vegetable varieties is increasing (McDonald, 2001). Several criteria suggest that southern Appalachia is unique for its high level of crop diversity relative to other southern regions. Among these criteria, southern Appalachia’s mountainous conditions create microclimates and isolated environmental niches that are conducive to rapid differentiation of crop

plants (Gray, 1999). Another criterion is that areas of high crop biodiversity are more geographically and commercially isolated and less densely populated subregions with difficult growing conditions. Finally, cultural autonomy may impact the crop biodiversity of a region (Smale et al., 2004). Southern Appalachia meets each of these criteria, at least relative to other agroecological regions in the South and the rest of the US, suggesting that it could be a region rich in crop biodiversity. Whealy (1998: 7) noted, “Heirloom seeds are especially prevalent in isolated mountain areas, such as the Ozarks, Smokies, and Appalachians, and also among

traditional peoples such as the Mennonites, Amish and Native Americans.” The study presented herein documented 134 heirloom vegetable varieties currently grown in western North Carolina through five months of fieldwork, and confirms that the region is an area of marginality within the US that currently maintains a high level of crop biodiversity.

The importance of plant diversity in agroecosystems is widely acknowledged for several reasons. Diversity in agroecosystems contributes to better food security, can increase local and national self-reliance, and allows for social and economic stability by contributing to a wider natural resource base and diversified entrepreneurial opportunities. Species and varietal diversity can also contribute to resistance of crops to pest and disease problems, and buffer climactic and other potentially adverse environmental events. Genetic diversity also provides the variation that allows crop species to readily adapt to environments through human and natural selection, which can contribute to greater stability and productivity of agroecosystems (Collins and Hawtin, 1999). The conservation of genetic diversity in crop species is also of immense importance to modern plant breeders. Heirloom and landrace varieties along with their wild relatives account for about 6% of the germplasm lines used to breed modern vegetable varieties – a contribution to global agriculture which is measured in the billions of dollars. In addition, small-scale agriculture which relies upon heirloom or landrace varieties accounts for 15–20% of the world’s food supply, providing sustenance and cultural value for about 1.4 billion indigenous and peasant farmers (Tuxill, 1999).

History has shown the importance of maintaining crop biodiversity. The most frequently cited example is the Irish potato famine. The potato crop of 1846 in Ireland rotted in the fields because of a fungal disease called “late blight” (*Phytophthora infestans*), which also occurs in southern Appalachia. One reason that the pathogen was so devastating was because the Irish farmers of that time grew only two closely related varieties of potatoes, neither of which possessed genetic resistance to late blight. As a result of this lack of agroecological and crop genetic diversity, over 1 million Irish people died (Rhoades and Nazarea, 1999). Late blight is thought to have originated in Central America and is not an uncontrollable problem in that region. However, farmers in Central and South America have traditionally cultivated over 3000 varieties of potatoes which affords some protection against devastating infestations. With that much biodiversity in the fields it is highly probable that some of those varieties have developed genetic resistance to late blight. Therefore, late blight has never caused a potato famine in that part of the world.

An example closer to the southern Appalachian region is the corn blight infestation (*Bipolaris maydis*) that

occurred in the southern United States in 1970. Over half of the corn crop in the US South was lost to corn blight. Plant breeders were sent scrambling to Mexico, where greater crop genetic diversity exists in corn varieties, to find a resistant gene that subsequently was bred into post-1970 US corn varieties (Rhoades, 1991). Southern Appalachia is not only a region that is potentially high in crop biodiversity relative to other areas in the American South, but it is also a region that is severely threatened with a dramatic loss of crop biodiversity unless steps are taken toward conservation.

Virchow (1999: 2) noted, “Aside from the sustainable management of soil, water, and air, it now seems to be accepted that the sustainable management of genetic resources is one of the four indispensable preconditions for a sustainable agriculture.” Currently, there is no strategy for conserving western North Carolina’s crop genetic diversity and no comprehensive data on what traditional vegetable varieties still exist in the region.

This study investigated the persistence of traditional heirloom vegetable crop species in western North Carolina and documented heirloom varieties that were still being grown. The western North Carolina mountains are part of the Blue Ridge Mountain Belt that extends from the New River Divide in southern Virginia to the mountains of northern Georgia (Gragson and Bolstad, 2006). The portion of the Blue Ridge in western North Carolina is the most rugged in the belt, with an average altitude that ranges between three and six thousand feet, culminating in the highest peak in the eastern United States – Mt. Mitchell at around 6700 feet in Yancey County (Beaver, 1984). I collected data from 26 individuals in 12 counties in the western North Carolina mountain region from January to July, 2005. My objective was to identify as many growers of heirloom vegetable varieties as possible across the region, “memory bank”¹ the ethnoecological knowledge of each variety they were growing, and collect seed samples to preserve in the seedbank of The Southern Seed Legacy Project at the University of Georgia.

I documented a wide range of information about western North Carolina heirloom vegetable varieties and attempted to answer the following research questions: Is western North Carolina a marginal region that is also rich in crop biodiversity? What species and varieties are most commonly saved among growers? Among what farmer age groups are heirloom vegetable varieties being maintained? What kind of grower is most likely to maintain heirloom varieties in their fields or gardens? How are heirloom vegetable varieties in western North Carolina classified? What varieties are regionally distributed and which varieties are unique to particular individuals or communities? Are heirloom varieties being widely maintained in communities or are they just being maintained by a few individuals?

History of vegetable cultivation in Southern Appalachia from the pioneer period to the present

Early southern Appalachian pioneers drew their agricultural knowledge from a wide range of cultural traditions. Frontier agriculture was influenced by Cherokee, Scots-Irish, German, and to a lesser extent English and Scandinavian land use patterns (Davis, 2000). The dominant form of frontier southern Appalachian agriculture was what is known as “forest fallowing” or alternatively as “slash and burn” (Otto, 1987). Forest fallowing was characterized by a practice of clearing the native forest growth for crop fields. Forests would first be “grubbed” by rooting up the forest underbrush with hoes and then piling and burning it. Farmers would then girdle the large trees by cutting a ring in the bark with axes in order to “deaden” the forest. Deprived of the rising sap to feed their leaves by girdling, the trees would subsequently drop their leaves and sunlight would penetrate to the forest floor and nourish crops. After a few years of cultivation, settlers would then remove the stumps and “deadenings” by calling on their neighbors to help in what they called a “log-rolling.” The most frequent crop planted in fields cleared in the forest fallow system was corn; however, wheat, barley, rye, and oats were also sometimes planted. The forest fallowing system in southern Appalachia remained an important agricultural method until the beginning of the 20th century, when a combination of population growth, changing land ownership patterns, and the partible inheritance system of dividing land equally between descendants made southern Appalachian average farm sizes too small to sustain it (Otto, 1987).

The German settlers had a different kind of agricultural system. They would clear cut fields instead of creating deadenings, burn all of the trees on site to create potash, and then remove all debris and rock from the fields, creating a parcel of land that was “free and clear” and ready for planting. The Germans also brought with them the practice of spreading animal manure over crop fields in order to maintain fertility. The unique German contributions to southern Appalachian frontier agriculture were less widespread than those of the Scots-Irish and English because they constituted a much smaller percentage of the population than those two groups (Davis, 2000). Cherokee contributions to frontier horticulture were numerous and varied. The Cherokee traditionally practiced both tree girdling and forest burning. Frontier settlers cultivated corn, beans, squash and gourds, all of which had been grown by the Cherokees in the region for hundreds to thousands of years. From the Cherokee, the settlers learned about cropping systems such as the “Three Sisters” (growing corn, beans and squash together in the same field) and food processing techniques such as drying squash and pumpkins by

hanging them on strings or wooden devices and stringing beans to dry as “shuck beans” or “leather-britches” (two regional names for this drying process). It is also possible that the settlers learned methods of making maple syrup from the Cherokee (Davis, 2000). The Cherokee contribution to Euro-American southern Appalachian agriculture began in the frontier period and continued into the 20th century.

The Antebellum Period was the next major historical influence on southern Appalachian agriculture. By 1830, frontier settlement had ceased in much of southern Appalachia and the Antebellum Period had commenced. Most of the original settlers in the region owned farms of between 100 and 300 acres which were forested (up to two thirds of the land cover); and characterized by major crop cultivation of corn, oats, rye, wheat, and to a lesser extent, buckwheat. Farmers also grew a diversity of staples including sweet and Irish potatoes, peas, beans, flax, tobacco and sorghum (Davis, 2000). Indian corn was the principle mountain crop of the era and fed both humans and animals (Sertzer, 2001; Williams, 2002). In western North Carolina, where crop selection was more diversified than in other areas in the region, 3.6 million bushels of corn were grown in 1860. In the southern Appalachian region as a whole, by 1860 corn production took up about one tenth of the average farmer’s improved land (Davis, 2000). However, many western North Carolina counties saw corn production decrease after the Civil War. Corn was central to the southern Appalachian subsistence culture. It was processed and made into hominy, hoecakes, grits, corn pone, mush, and whiskey (Sertzer, 2001). The cornhusks and leaves were made into hats, dolls, chair bottoms, and mops. Corncobs were used for bowls, tobacco pipes, fire starters, and toilet paper. Community gatherings known as “cornshuckings” (or frolics) occurred at harvest time. Though a subject of much debate (see for example, Dunaway, 1996), it appears that southern Appalachia had a higher percentage of subsistence farmers than other regions of the country. Although some well-situated southern Appalachian farms were predominately market oriented, it seems likely that most were subsistence oriented during the Antebellum, selling to the market only when home needs had been met (Davis, 2000). Historian Martin Crawford (2001: 24) writes, “Whatever the character and authority of mountain elites or the extent of mountain farmers’ integration with the wider regional and national economy, southern Appalachia remained an overwhelmingly small-farm, subsistence-oriented region whose economic development was inhibited by a variety of geographic and cultural factors.” This perspective is in agreement with Ronald Eller’s (1982: 16) observation that, “By 1880, Appalachia contained a greater concentration of noncommercial family farms than any other area of the nation.” As mentioned earlier, the farms of

antebellum southern Appalachia were relatively small and highly diversified. The relative lack of interest in large-scale commercial farming allowed for considerable agricultural experimentation by local growers, resulting in a diversity of crop varieties (Davis, 2000: 144):

Bean, pea, and corn varieties were hand selected or cross-fertilized in order to produce strains better suited for mountain microclimates. Some particular strains were bred for exceptional flavor, others for a unique color or a particular shape or size. Many antebellum fruits and vegetables would not even be recognizable to modern growers, including Gourdseed corn, a variety whose ears could be easily shelled by flocks of foraging turkeys. Green nutmeg muskmelons known as Rocky Fords were raised in favor of commercial cantaloupe varieties. In eastern Kentucky, a pole bean variety known as Ruth Bible became popular for its resistance to drought, whereas Turkey Crow was grown in north-eastern Tennessee, North Carolina, and southwestern Virginia. Of course, all families saved their own vegetable seed every year, giving rise to a cultural tradition that in some mountain areas continues to this day.

John Opie (1980) has made the case that the small-scale, subsistence oriented, family farmer of antebellum southern Appalachia was the model and ideal by which many Americans identified themselves at that time. Whether or not Opie's observation is accurate or romanticizing of the region's farmers, after 1850 the farmers of antebellum southern Appalachian began to see their fortunes change as a result of the ravages of the Civil War, increasing population pressure, and the continuing depletion of the soils of the region (Davis, 2000).

The final stage of southern Appalachian farming is the modern era. Starting in the late 19th century, farming in southern Appalachia began a gradual and dramatic decline. In 1880, the average size of the southern Appalachian farm was 187 acres, and by 1930 it had decreased to only 76 acres (Bureau of Agricultural Economics et al., 1935; Eller, 1982). Eller (1982) noted a diversity of factors contributing to this decline. These included the increase of ownership of land by outside mineral and timber companies that reduced the commons that had been traditionally used for grazing and gathering activities; further reduction in the commons by the establishment of large national forests and parks in the region; logging activities that increased flooding and decreased soil fertility; increasing population levels and more intensive monocropping farming strategies; and inheritance practices that subdivided family farms among descendants, and decreased overall farm size. Despite these changes, Appalachia still had the nation's largest collection of farms that met the government's definition of "self-sufficing" in 1930 (Bureau of

Agricultural Economics et al., 1935). As the 20th century moved forward, agriculture in southern Appalachia continued to decline. Between 1969 and 1974 over a million acres of farmland went out of agricultural production in Appalachia and 17,000 farmers (26% of the farming population) left farming occupations (Appalachian Land Ownership Task Force, 1981). This decline mirrored the decrease in the farming population in America as a whole, as farming became increasingly dominated by large corporate farms that applied green revolution technologies and government aid to increasingly larger farms, employed few people, and drove family farmers out of business (Berry, 1977; Fisher and Harnish, 1981).

The decrease of the farming population had a dramatic impact on the agricultural practices of southern Appalachia. The incredibly diverse farms of the Antebellum Period gave way to monoculture-oriented modern farms. The growing of wheat and rye for flour began to decline. Mountain families became increasingly dependent on outside food sources such as light breads, whole milk, and processed sugars (Davis, 2000). Corn production continued but was less important as the grazing of livestock declined and corn was grown less for supplementary animal feed. Bean markets in northwest North Carolina in the 1940s and 50s encouraged bean cash crops and the planting of high-yielding modern varieties in the place of traditional Appalachian beans (G. Brown, personal communication; Fletcher, 1963). Tobacco cultivation intensified in the mid-1920s, was standardized across the region with the advent of the federal tobacco program in 1933, and its production as a cash crop steadily replaced diversified subsistence-oriented cropping patterns. By 1978, 90% of farms in Madison County, North Carolina, grew tobacco. Wheat, barley, buckwheat and rye (with the exception of a small amount of wheat) had stopped being grown in Madison county prior to 1970 (Algeo, 1998). Christmas tree farms and landscape shrubbery are the other two forms of horticultural enterprise that have come to dominate western North Carolina. Christmas tree growing began to be promoted in western North Carolina by extension agents in the 1960's. By 1980, Christmas tree growers in North Carolina harvested 1.5 million trees, which represented 5% of the national supply (Stevens, 1987).

In the last 50 years southern Appalachia has become a post-agrarian rural society. For example, between 1967 and 1977, 25% of land in Madison County was sold to people from out of the state, mirroring a pattern across western North Carolina. Most of the in-migration has been fueled by retiree and seasonal second-home owners. Agriculture has continued to decrease as land values and taxes have increased, forcing natives to seek public work or other jobs in the cities (Algeo, 1998). Most farmers in the southern Appalachia of today are part-time farmers

who grow Christmas trees, landscape shrubbery, or tobacco. With the recent tobacco buyout, tobacco farming may decline in the near future. Southern Appalachian farms have become increasingly less diverse in crop species.

Through all of the changes that have characterized southern Appalachian agriculture, the homegarden is an institution that has not been completely lost. Each spring thousands of residents of southern Appalachia plant vegetable gardens that help them provide for the food needs of their families. Although homegardening is also an institution that is in decline in southern Appalachia (G. Brown, personal communication; T. McCoury, personal communication; L. Schuford, personal communication), the homegarden remains the principal place where a diversity of traditional southern Appalachian heirloom vegetable varieties can be found. The homegardens of southern Appalachia are modern links to the entire agricultural history of the region.

Methods

Field data for this research were collected in order to record and analyze the history and current state of heirloom varieties of vegetable crops across the Appalachian region of western North Carolina utilizing two main methods used in the memory banking (Nazarea, 1998) approach to agrobiodiversity studies: life history elicitation, and collection and preservation of cultural histories and seed samples. I conducted 10 full-length, semi-structured interviews with 17 individuals (including some interviews conducted with more than one family member). Full-length interviews were requested when I determined (through phone contact) that the individual to be interviewed was maintaining a significant number of heirloom vegetable varieties, was maintaining particularly unique varieties, or had exceptional knowledge about the history of seed saving in the region. Shorter semi-structured phone interviews were conducted with nine other individuals who maintained only a few varieties or had less information to contribute. The interviews probed the cultural history of each vegetable variety within the farmer's family or community, the biophysical conditions in which the varieties were typically grown, the methods each farmer used in growing each variety, pest and disease susceptibility and tolerance, and storage and eating qualities. Geographical areas for interviews were selected based on criteria determining them to be rich in crop biodiversity. Criteria included factors such as a large population of farmers or gardeners, a significant number of older farmers, and rural character.

I used a snowball sampling method based on contacts that I made in the area to identify individuals to inter-

view. Since I had already been gardening in western North Carolina using heirloom vegetable varieties for over 6 years, I first contacted key informants who I already knew to be maintaining heirloom varieties. I also contacted selected county agricultural extension agents to see if they knew of any heirloom growers. Finally, I consulted members of the Appalachian State University community to see if they knew of any useful contacts. Detailed histories of every heirloom vegetable variety described in the interviews were recorded so that the history and existence of the varieties are now documented and future research in this area of study will be enriched (not all of the variety descriptions are included in this article due to space limitations). The variety descriptions contain both cultural and biological information about the vegetables and their history.

Life history interviews were tape recorded, transcribed, and entered into the qualitative data analysis software program Atlas.ti 5.0, where they were coded and analyzed according to themes and attributes that arose from the data. The interviews will be donated to the memory banking project of the Southern Seed Legacy at The University of Georgia. All seed samples collected in this study have been duplicated where needed and donated to the Southern Seed Legacy.² It will thus be insured that the traditional vegetable varieties and their histories collected in this research will be preserved for the use of future generations and can be utilized if a western North Carolina seed preservation project is initiated in the future.

Results and discussion

Western North Carolina heirloom vegetable varieties that are still being grown and who is growing them

In this study I collected 134 descriptions for western North Carolina heirloom vegetable varieties from 26 informants. Of those 134, bean varieties were the most numerous, followed by tomatoes, squash, corn, and potatoes (see Table 1). Beans are noted for their high levels of diversity and are the easiest among seeds to save because they self-pollinate and are easy to dry. Tomatoes are also self-pollinated but have a more complex seed-saving requirement that involves allowing the seed to ferment before drying, and they are also harder to grow due to their tendency to be infested with late blight (*Phytophthora infestans*). Corn and squash are much harder to maintain as pure varieties because they readily cross-pollinate, and potatoes can be tricky to maintain because they require specific storage conditions and a lot of space. From my results it is clear that farmers in western North Carolina have tended to save the seeds of heirloom varieties that are the easiest

Table 1. Heirloom vegetable varieties grown in Western North Carolina.

Vegetable	Scientific name	Local varietal names	Number collected	% of total varieties documented ^a
Beans	<i>Phaseolus vulgaris</i> <i>Phaseolus coccineus</i>	Bunch	83	61.9
		Half-Runner		
		Pole		
		Butter (Runner Bean)		
Tomatoes	<i>Lycopersicon esculentum</i>	Tommytoe (cherry)	24	17.9
Squash	<i>Cucurbita maxima</i> <i>C. mixta</i> <i>C. pepo.</i>	Candyroaster	8	6.0
		Cushaw		
		Crookneck (summer)		
Corn	<i>Zea Mays</i>	Bread (dent)	7	5.2
		Hominy (dent)		
Potato	<i>Solanum tuberosum</i>	Irish	4	3.0
Brassicas	<i>Brassica juncea</i> <i>Brassica napis</i>	Hanover	2	1.5
		(Rutabega)		
Sweet Potato	<i>Ipomoea batatas</i>		2	1.5
Cucumber	<i>Cucumis sativus</i>		1	0.8
Gourd	<i>Lagenaria siceraria</i>		1	0.8
Parsnips	<i>Pastinaca sativa</i>		1	0.8
Peppers	<i>Capsicum annum</i>		1	0.8
Total			134	100.2

^aNumbers don't sum to 100 due to rounding.

to save and which are very important in the culinary traditions of the region.

The ages of the farmers and gardeners from whom I collected variety histories from ranged from 20 to 90 years old. The 40- to 49-year-old age group provided the largest age demographic that was interviewed (eight individuals, 30.8%) and also maintained the highest percentage of varieties (33.3%). The 60- to 69-year-old age group maintained the second highest percentage of varieties (29.5%) and also maintained the highest number of varieties per grower (9.5) (see Table 2). Most of the individuals I obtained seed histories from were home gardeners, and the next largest group of seed savers was farmers (see Table 3).

I collected varietal histories from individuals living in 12 counties in western North Carolina. The three counties from which I collected the most histories were

Table 2. Ages of research subjects and percentages of heirloom varieties being maintained by each age group.

Age group	# of individuals	% of total individuals ^a	# of varieties maintained	% of total varieties ^a
20–29	1	3.8	1	0.8
30–39	5	19.2	11	8.5
40–49	8	30.8	43	33.3
50–59	1	3.8	13	10.1
60–69	4	15.4	38	29.5
70–79	4	15.4	14	10.9
80+	3	11.5	9	7.0
Total	26	99.9	129	100.1

^aNumbers don't sum to 100 due to rounding.

Yancey (47 varieties or 35.6% of all varietal histories), Watauga (32 or 24.4%), and Ashe (18 or 13.7%). The number of heirloom vegetable varieties collected in Yancey, Watauga, and Ashe counties cannot be taken as an indicator of how much heirloom seed diversity has survived in each of the counties or the region as a whole.

Since I used a snowball sampling method, I relied on contacts that I established to provide additional sources for seed histories. It was not surprising that Yancey and Watauga Counties provided the largest number of seed histories since those are also the two counties in which I have lived and had the most contacts. Ashe County, with the third-highest number of seed histories, is close to and sufficiently integrated socially with Watauga County to have also provided me with a large number of contacts. My analysis indicates that the results for Yancey and Watauga Counties are fairly representative of the amount of seed diversity that remains in each of those counties, but as I attempted to collect seed histories from counties

Table 3. Grower categories of research subjects.

Category	Number	% of total individuals*
Home gardeners	15	57.7
Farmers	5	19.2
Business operators	4	15.4
Seed exchange operators	1	3.8
School gardeners	1	3.8
Total	26	99.9

*Numbers don't sum to 100 due to rounding.

in which I had fewer contacts and had to travel further, the number of seed histories decline. Further research is needed to paint a true picture of the overall remaining heirloom vegetable varieties that exist in western North Carolina. This study serves as a foundation and reference for a more comprehensive study.

Lost varieties

In addition to asking questions about the varieties that growers still maintained, I also inquired about varieties that had been lost over the years. The answers varied. Some growers said that they still maintained all of the varieties that their parents and grandparents had grown, while other growers had long lists of varieties that had been grown at various times during their lifetimes by their families but were now lost. In total, I identified 49 vegetable varieties that had been lost to these growers (see Table 4). At first glance this would seem to indicate that more varieties were being maintained than had been lost (because the varieties maintained outnumbered those that were lost in this study by 2.7 to 1), but a closer analysis shows that this is more than likely not the case. As I was contacting potential interviewees for this study, I was referred to numerous informants who assured me that they were no longer maintaining any of

the heirloom varieties that had been traditionally grown, and I also learned of individuals who had lost all of their heirloom varieties, and these greatly outnumbered the 26 informants who were maintaining heirlooms and so were included in the study. Additionally, the recall of heirloom varieties that may have been grown by the informant's grandparents and parents many decades ago were likely more readily forgotten than varieties that were currently being grown and consumed. One interview may be particularly telling in this latter regard. Troy McCoury, an informant for this study, had a particularly sharp memory. This was verified by his son and by his on-the-spot performance of his high school valedictorian speech from the late 1930s that had been stored in a lockbox since he originally gave it (T. McCoury, personal communication). Out of the 49 heirloom varieties recalled from memory that were recorded in this study, Mr. McCoury provided 24 of them (49%). Many of the other informants complained about having trouble remembering the names of lost varieties from the past, so it is obvious that not only are there varieties that have been lost from cultivation, but there are also many varieties that have been lost from memory as well. If all of the informants had possessed the long-term memory capacity of Troy McCoury, it is likely that the list of lost varieties would have been much longer.

Table 4. Lost varieties of heirloom vegetables.

Vegetable	Scientific name	Local types	Number recalled	% of total lost varieties ^a
Brassicas	<i>Brassica Oleracea</i>	Hanover	13	26.5
	<i>Brassica juncea</i>	(Rutabega)		
	<i>Brassica napus</i>	Creasy Greens		
	<i>Brassica rapa</i>			
	<i>Lepidium sativum</i>			
Beans	<i>Phaseolus vulgaris</i>	Bunch	12	24.5
		Cornfield		
		Half-Runner		
		Pole		
Corn	<i>Zea Mays</i>	Bread (dent)	7	14.3
		Hominy (dent)		
Potato	<i>Solanum tuberosum</i>	Irish	4	8.2
Squash	<i>Cucurbita mixta</i>	Cushaw	3	6.1
		<i>Cucurbita spp.</i>		
Tomatoes	<i>Lycopersicon esculentum</i>	Tommytoe	3	6.1
Peanuts	<i>Arachis hypogaea</i>		2	4.1
Peppers	<i>Capsicum annuum</i>		2	4.1
Peas	<i>Pisum sativum</i>		1	2.0
Sweet Potato	<i>Ipomoea batatas</i>		1	2.0
Wheat	<i>Triticum spp.</i>		1	2.0
Total			49	99.9

^aNumbers don't sum to 100 due to rounding.

Southern Appalachian heirloom vegetable variety classification

One of my research questions addressed the issue of how southern Appalachian heirloom vegetables are classified. Although reporting on the full range of results regarding how southern Appalachian vegetables are classified is beyond the scope of this paper (and deserves a whole article itself), below I included a diagram and description of how beans are classified in western North Carolina, moving from more general to more specific categories (see Figure 1). Beans are perhaps the most intricately classified vegetable in western North Carolina. The results can be considered fairly comprehensive but not complete, because future research may yield additional classificatory nomenclature. Gardeners and farmers in western North Carolina tend to have their own classification system for vegetable varieties that is fairly widespread throughout the southern Appalachian region. Some of the varietal classifications are also common to other parts of the country, but taken as a whole, southern Appalachian vegetable growers may be considered to have developed a unique system.

Bunch beans

“Bunch beans” are beans that do not send out running vines and set their beans close to the ground. Most commercial seed catalogs and growers refer to bunch beans as “bush beans.”

Half-runner beans

These are beans that usually produce prolific yields and send out running vines that are not nearly as long or unwieldy as pole or cornfield beans (Best, 1999a). They combine the better taste of pole beans with the easier growing characteristics of bunch beans. These are the

usually the preferred type for canning in the southern Appalachian region.

Cornfield beans

These are vining beans that have traditionally been grown in cornfields to allow the beans to use the cornstalks as a trellis. Best (1999a) suggests that all or most pole beans are in fact beans that were once grown in cornfields. This may be true, although significant adaptation may have taken place during the last several hundred years in pole beans that have been grown in full sun that would now make them less successful in a cornfield setting. Den Biggelaar (personal communication) has suggested to me that cornfield beans are better adapted to the shady conditions of a cornfield. It is also possible, based on my own observations and those of others (D. Bradford, personal communication), that cornfield beans are less-heavy producers that set their beans in characteristic clusters along the vine. Despite this apparent confusion, the term “cornfield beans” as used by most southern Appalachian growers signifies a bean that is traditionally grown in a mutualistic relationship with corn. Best (1999a) also subdivides cornfield varieties into “cutshort” and “greasy” categories (and he may be correct in doing so), but I have listed both cutshort and greasy bean varieties separately because they are usually not connected with the cornfield label in the beans that I have collected.

Butterbean

This name (as I have encountered it) refers to a different bean than what growers outside of southern Appalachia usually refer to as a butterbean. Growers in the non-Appalachian South usually call lima-type heat-loving beans that don’t grow well in the mountains butterbeans (*Phaseolus lunatus*), whereas the growers I have interviewed call runner bean varieties (*P. coccineus*) butterbeans.

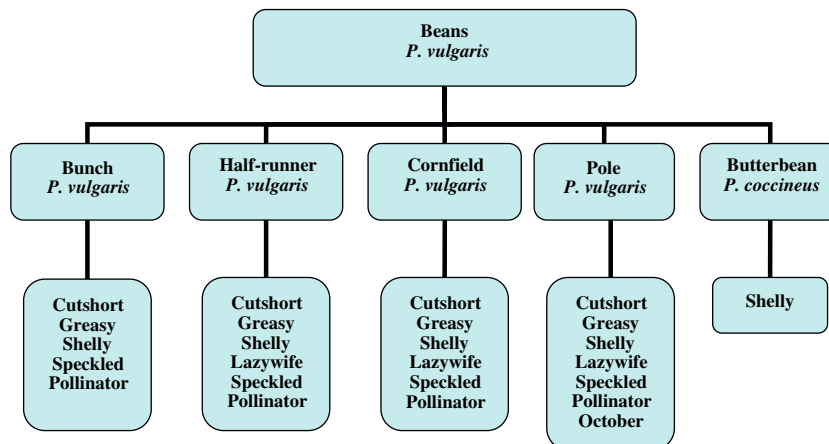


Figure 1. Southern Appalachian bean classification (results for western North Carolina)..

Pole beans

This term follows standard American nomenclature and signifies a bean with a running vine that needs to be trellised. See “*cornfield beans*” above for a discussion on the difference between “pole beans” and cornfield beans.

Cutshort Beans

These are beans in which the seeds in the pods are so tightly packed together that it causes them to square off on the ends (as opposed to the typical rounded seed type). Because they do not grow into the completely round shape of most seeds they are considered to be “cut short” (Best, 1999a).

Greasy beans

This is a bean that doesn’t have any hairs on its pods, causing it to have a “greasy” or slick appearance.

Shelly beans

These are beans that are grown to be eaten when the seeds have grown to maturity but have not yet dried. The (usually) large seed is then removed from the hull and cooked. I have also heard people refer to beans that are grown to be dried as “shell beans” but the general use for the term “shelly bean” is as described above.

Lazywife beans

The term “lazywife” refers to beans that grow in clusters of 4–5 pods at separate nodes along the vine. The variety got the name “lazywife” because it has been traditionally favored by Appalachian housewives due to their ease of harvest compared to beans that grow sporadically up the vine, individually, or in pairs of pods along various nodes on the vine.

Speckled beans

“Speckled” is simply a modifier that indicates that the bean seed is not uniform in color but has speckles of one color on top of another, therefore the bean is called “speckled.”

Pollinator beans

This refers to beans that are notorious for cross-pollinating at high frequencies with other bean varieties. This is a useful distinction because most bean varieties are 90–95% self-pollinating.

October beans

These are very late season beans (often harvested after the first frost), usually eaten as shelly or dried beans, and are typically very large and meaty. It is often the case that a single bean variety can be classified in several of the categories listed above. For example, a bean could be called a “Long Speckled Greasy Cutshort Cornfield Bean” (Best, 1999a). The general pattern is to start with

more specific bean characteristics at the beginning of the name and move to more general categories at the end of the name. Using a combination of the several bean categories in naming a particular variety allows the southern Appalachian grower to more accurately describe the physical characteristics of the bean to someone who is familiar with their system.

Regional trends and varieties

During the course of my research it became apparent that some varieties were grown widely across the region (see Table 5), while others seemed to be unique to particular families or communities. For example, I gathered seven different variety descriptions for “Pink Tip” beans (*Phaseolus vulgaris*). It may seem redundant to gather variety descriptions for the same bean multiple times, but because of southern Appalachia’s diverse environmental conditions, considerable variation may exist in vegetable varieties that have the same name and may have derived from the same parent plant. A farmer in Ashe County (Anonymous, personal communication) told me that the Pink Tip bean that he grows has a white hull and can be grown as a bush bean. He also told me about another farmer in his county that has some Pink Tip beans that “are purple, they’ve got a purple hull, they’re a wild looking thing.” This shows that even growers that are in the same county may have variations of the same variety

Table 5. Western North Carolina heirloom vegetable varieties with region-wide distribution.

Variety	Vegetable	# collected	% of that individual vegetable variety collected
Greasy Type	Bean	15	18.5
Pink Tip	Bean	7	8.6
Turkey	Bean	3	3.7
October	Bean	3	3.7
Butterbean	Bean	2	2.5
Lazywife	Bean	2	2.5
Goosebean	Bean	1	1.2
Striped	Tomato	7	29.2
German Type			
Brandywine	Tomato	1	4.2
Hickory King	Corn	3	42.9
Candyroaster	Squash	1	14.3
Cushaw	Squash	1	14.3
Yellow	Squash	1	14.3
Crookneck			
Early Rose	Potato	1	25.0
Green Mountain	Potato	1	25.0
Total/Average		49 (total)	13.99 (average)

that show a significant amount of phenotypic diversity. Among Pink Tip bean seed that I collected I also noticed a variation in seed size, shape, and color, although they were all recognizable as Pink Tip-type brownish seeds. It is also likely that one common name is used as a blanket term to name several different distinct seed varieties in some cases.

Another bean variety that seems to have diffused throughout the region is the “Greasy Cutshort” (*P. vulgaris*). Greasy Cutshort beans share two main characteristics: (a) the pods are hairless and have a “greasy” appearance and (b) the seeds of the bean grow so close to one another in the pod that they have a square-shaped appearance (Best, 1999a). Most of the seven Greasy Cutshort beans for which I gathered histories were white colored of various sizes, but some of them were brown. There is apparently a lot of genetic variation in the Greasy Cutshort, so I documented all that I discovered. Another popular bean name is “Greasy,” and the 15 different Greasy Beans that I collected had a variety of names.³

There are five other bean varieties I collected that seem to have a more regional distribution. They are the “Turkey Bean,” “October Bean,” “Goose Bean,” “Butterbean,” and “Lazywife bean.” Turkey beans (*P. vulgaris*) seem to have to most uniformity of the five and generally have a brown seed with a white blush on one side that comes in slightly different sizes and shades. October beans (*P. vulgaris*) are generally late season beans with large seeds. Some October beans may also be called “Cherry” beans in northwestern North Carolina. Goose beans (*P. vulgaris*) have a dark, flat, and dull green seed (I didn’t collect a variety of goose bean seeds, but Bill Best confirmed their regional distribution). Butterbeans are a “runner bean” type (*Phaseolus coccineus*) with a very large seed in a variety of colors; they are also referred to as “Jack Beans” in northwestern North Carolina. The Lazywife (*P. vulgaris*) is a bean variety that is widely distributed but probably didn’t originate in western North Carolina; other food historians have documented it as being introduced into Pennsylvania in 1810 from Germany (Stickland, 1998; Watson, 1996; Weaver, 1997).

Seven other vegetable varieties that I collected seem to have a region-wide distribution. I documented three “Hickory King” corn varieties (*Zea mays*) that have different numbers of rows of seeds on the cob (8–15) and are either white or yellow and white. Several of my informants agreed that Hickory King has traditionally been the standard source for hominy corn in the region. Two potato varieties, “Early Rose” and “Green Mountain,” (*Solanum tuberosum*) seem to have historically had regional distribution but now are grown by select individuals only. Neither of these varieties is uniquely southern Appalachian, as Green Mountain was originally introduced in Vermont in 1885 (Stickland, 1998; Weaver, 1997) and Early Rose in New York in 1861 (Weaver,

1997). Both varieties are cultivated outside of the region today and are well known to seed savers. I documented the varieties because they have a long history in the region and may have developed particular adaptations to western North Carolina and also because it is rare to come across someone in the region who has been continuously maintaining traditional potato varieties.

Three squash varieties that I collected are regionally distributed. The “Candyroaster” (*Cucurbita maxima*) is thought to have been bred by the Cherokee Indians and is indigenous to western North Carolina; the “Roughbark Candyroaster” is a unique Candyroaster variety that I discovered in my research. The “Cushaw” (*C. mixta*) squash originated in the West Indies and was introduced into the southeast before 1700 (Stickland, 1998). It has historically been grown across western North Carolina and is still grown today, but appears to be rare. “Yellow Crookneck” (*C. pepo*) is another squash variety that I collected that has both regional and national distribution.

The final two vegetable varieties I collected that have regional variation are tomatoes (*Lycopersicon esculentum*). The first has a variety of names. The names that I collected it under include “Boyd Smith German Yellow,” “Candystripe,” “Mister Stripey,” “Striped German,” “Stripe,” “Striper,” and “Stripey.” It is known to most long-time gardeners native to the region and is also sometimes called “Hillbilly,” “Pineapple,” “Georgia Streak,” and “Old German.” It is a very large beefsteak-type tomato that has characteristic yellow and red stripes and is quite sweet. Many of the different names signify varieties that differ slightly in size and color pattern. The variety may have originated in Mennonite or Amish communities (Best, 1999b), is thought to have been introduced into western North Carolina from Virginia about 30 years ago (T. McCoury, personal communication), and is now perhaps the most popular regional cultivar. The other variety that has a wide distribution and a long history in the region is the “Brandywine,” a traditional Amish tomato that has an international reputation for excellent eating quality.

Variety descriptions and history

I collected descriptive histories for 134 seed varieties following memory banking protocols (Nazarea, 1998). This valuable and interesting cultural history and cultivar propagation information is rich and occupies 15 pages of text. I have included one example of a seed variety history.⁴ The following is a quotation from the grower who maintains this heirloom variety:

Well, that’s that old-timey mustard. And I watched it, little as it was a week or two, it looked to me like there was another plant that come up in there,

mustard. And I let it go to seed and got my seed off of it. Yes sir. That's the best mustard to me that there is. Just has a better taste to it, you know, than the other ones. Some of them don't have any taste to it. This mustard's kind of good. It's not a curly mustard, it's a straight mustard." (J. Banner, personal communication, January 14, 2005; Green Valley Community, Watauga County).

Conclusions

Southern Appalachia has a long history as a region that is rich in crop biodiversity. From the Pioneer-era farmer up until the mid-20th century, growers in western North Carolina have maintained a wide diversity of crop species. Since the 1950s the subsistence orientation and farming population of western North Carolina have declined dramatically, resulting in a threat to the survival of heirloom vegetable varieties. However, western North Carolina remains a region of marginality within the United States. As late as the 1960s many writers described living conditions within southern Appalachia as analogous to those in many countries in the Global South (Gragson and Bolstad, 2006). Although conditions have changed considerably since that time, many areas within southern Appalachia remain among the poorest in the US (Crooks, 2001). Rhoades and Nazarea (1999: 219–220) observed, "Universally, regions of rich biodiversity exist along the margins of their economic and political worlds. Landrace cultivars are typically found in more remote mountains, islands, rainforests, or desert agroecosystems which are momentarily insulated from the dominant forces of the outside world economy." Although it can hardly be argued that southern Appalachia, or anywhere else in the US for that matter, is "momentarily insulated from the outside world economy," this study confirms that western North Carolina is a region of relative marginality that is also rich in crop biodiversity. With the documentation of 134 named vegetable varieties in a little more than 5 months of field research, the amount of biodiversity found in western North Carolina compares favorably with results from similar studies of crop plant biodiversity in remote indigenous mountain communities in the Global South (e.g., Skarbo, 2006).

This study confirmed my assumption that the majority of western North Carolina's heirloom vegetable varieties are maintained by home gardeners. The propensity of residents of the region to value family culinary traditions (B. Best, personal communication) has perhaps motivated western North Carolina gardeners to save heirloom vegetable varieties long after the region became a post-agrarian rural society. The salience of such culinary traditions and other important cultural traditions and

memories and their contribution to the persistence of biodiversity offers a promising direction for future research (Nazarea, 2006). However, it became increasingly obvious during the course of my research that many of western North Carolina's heirloom vegetable varieties have been lost. Many individuals that I identified as being likely sources of heirloom seeds no longer kept the varieties of their forefathers. I talked to several individuals who told me that they had saved seeds that had been handed down to them by their parents for many years, but had recently let them die out. It also appeared that many communities had only a few individuals who still saved heirloom seeds, whereas some communities seem to have lost their heirloom vegetable heritage altogether. As farming continues to die out as a way of life and as young people are forced to continue to move out of the region due to increasing land prices and lack of economic opportunities, it seems highly likely that what is left of the cultural tradition of seed saving will continue to disappear.

I was surprised to find that most of the varieties I collected were not being maintained by the older generations. Based on previous experience, I had assumed that most varieties would be provided by growers 60 years or older. The observation that individuals between the ages of 40 and 49 represented the highest percentage of growers that maintained the highest percentage of the total varieties collected of any 10-year age group was unexpected. I would be interested to see what age group a more comprehensive study would find to be maintaining the highest levels of diversity.

Of the heirloom varieties that I collected in this study, beans were the most numerous and tomatoes were the second most numerous. From there the numbers of particular varieties that I collected dropped off considerably. It is telling that out of 26 individuals that I interviewed, only four are maintaining heirloom corn varieties (of which three are in the same family), and only four are maintaining old-timey potato varieties. I imagine that if you interviewed individuals during the first part of the 20th century, almost every family would have been growing heirloom corn, beans, squash, and potatoes. What varieties do remain today are vestiges of an era where crop biodiversity was the very foundation of an agrarian way of life.

To comprehensively document all of the remaining heirloom vegetable varieties in western North Carolina would require a research project much larger in scope. One of my informants (B. Best, personal communication) indicated strongly that Madison County, North Carolina might contain more heirloom beans than any other *state* in America, but I was unable to develop very many useful contacts there. Future research should incorporate a detailed investigation into the persistence of heirloom varieties in Madison County.

Many of the 134 varieties that I documented in this study have a high likelihood of being varieties that are unique to particular individuals or families and may be in danger of being lost forever. One example is the “Roughbark Candyroaster” winter squash (*Cucurbita maxima*). It is being maintained by the Bradford Family of Bald Mountain in Yancey County and in their opinion it has a much richer flavor than regular “slick candyroasters” (which are more numerous and are an endemic cultivar to North Carolina that originated with the Cherokee Indians), and is distinguished by its rough and hard skin that improves its storing qualities. Darick Bradford (personal communication) also believes that the “Roughbark” is a more primitive form of “Candyroaster” than the regular “slick roasters.” It is traditionally used for pies, candyroaster butter, candyroaster bread, and as a wintertime compliment to bean dishes. In addition to the “Roughbark Candyroaster,” it is likely many other unique vegetable varieties that I have documented in this study are in danger of extinction.

This study has attempted to contribute toward the task of preserving some of western North Carolina’s heirloom vegetable varieties. The fact that the varieties I have documented are now known outside of the families that have grown them for generations is a good start. The varieties for which I was able to obtain seed samples have been multiplied and donated to the seed collection of the Southern Seed Legacy at The University of Georgia. Transcriptions of the interviews that I conducted with growers will also be deposited at the Southern Seed Legacy. I have also made copies of the vegetable variety descriptions and sent them out to individuals who participated in this study and to other interested growers and organizations. So in the short term, many of the 134 vegetable varieties that I documented and the cultural information that goes along with them are not in danger of going extinct. But what of the hundreds of other heirloom vegetable varieties that must exist in western North Carolina? It can only be hoped that a comprehensive seed conservation strategy can be developed and maintained for western North Carolina (Veteto 2005) and that the results of this study may help contribute to the task. Western North Carolina is a region that has a rich heirloom vegetable tradition which contains genetic and cultural information that may help toward the survival of future generations.

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Notes

1. Memory Banking is a methodology pioneered by Virginia Nazarea (1998) that seeks to compliment the more conventional methods of seedbanking crop genetic resources. Memory Banking makes an effort to collect ethnoecological knowledge about crop varieties such as when to plant them, what kind of microclimates they thrive in, how they are best preserved, and what kind of inputs they need. Cultural information is also collected such as mythologies and beliefs associated with the crops, culinary traditions and recipes, and memories and stories. Memory Banking gives anyone attempting to use or understand heirloom crop varieties in collections a much broader context than traditional ‘passport data’ that is collected in *ex situ* conservation.
2. The Southern Seed Legacy is an innovative seed saving project that is housed in the Department of Anthropology at The University of Georgia. More information about the project can be found on their website at <http://www.uga.edu/ebl/ssl/>
3. Names for “greasy beans” include: “Bertie Best Greasy,” “Big Greasy,” “Big Greasy Bean,” “Big Speckled Greasy,” “Cherokee Greasy,” “Greasy Bean,” “Greasy Stone Bean,” “Late Long Greasy,” “Little Greasy Cornfield Beans,” “Margaret Best Greasy,” “Medium Greasy,” “North Carolina Long Greasy,” “North Carolina Market Greasy,” “Small Lazywife Greasy,” and “White Greasy Bean.” Numerous shapes, colors, sizes, and patterns appear on these seeds. It is obvious that there is a lot of diversity in beans named “greasy.” To make matters even more confusing, some beans that are named “greasy” have cutshort beans, so they should actually be properly named “greasy cutshorts.” In addition, some beans are named “greasybacks,” a distinction that I haven’t quite figured out. As noted above, southern Appalachian seed nomenclature has definitive categories for naming seed types, but it appears that seeds are often either misnamed or parts of the name are left out as they are passed around. This confusion in nomenclature is perhaps seen best in the “greasy” and “cutshort” types.
4. Old Timey Mustard: Banner recovered these mustard greens when he was digging a hole to build his basement. Seeds which sprouted in the dirt that he removed were recognized by Best as the Old Timey Mustard that his mother had grown in her garden since 1892 on Sugar Mountain in Avery County. This mustard green has leaves that look like an oakleaf and are green with a red/purple outline along the edge of each leaf. It is very spicy when eaten raw but loses

its spicy character when cooked. When cooked, the mustard tastes similar to kale. The leaves have hairs on them that are similar to stinging nettles and may irritate the skin when touched (J. Banner, personal communication).

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- Address for correspondence:* James R. Veteto, Laboratories of Agricultural and Natural Resource Anthropology and Ethnoecology and Biodiversity, Department of Anthropology, The University of Georgia, Athens, Georgia, USA
Phone: +1-706-5421430; Fax: +1-706-5423998;
E-mail: jv61598@uga.edu