

Hopi Farmer Survey Results

by

Debra Moon, Consultant
& Matt Livingston, Agent
Cooperative Extension
University of Arizona
(928) 734-3708

In 2003, the Hopi Pu'tavi Project conducted a survey of farmers' needs on Hopi. Representatives for the project interviewed seventy-seven farmers. The information was entered into a database at the Pu'tavi office. Dr. Cornelia B. Flora, of Iowa State University, did most of the database design with assistance from Ms. Debra Moon, the hired project consultant, and Matt Livingston, the project director.

What needs to be clear to the reader is that there were only 77 interviews. Time and funding was not sufficient to interview everyone who wanted to be interviewed. Additionally, this survey represents a snapshot of time here at Hopi, what people were saying when they were interviewed. Overtime, people's opinions and outlooks can change.

Part One

Crop Production – Field, Orchard, and Garden

Corn is the crop most important on Hopi. It is grown by nearly everyone. Corn products are used in most parts of Hopi ceremonial life. Corn is prepared and consumed by Hopi in different forms.

Other crops are very important also, especially beans. Beans and squash were mentioned the most after corn in the survey. With exception of the Moencopi area almost all is still dry-farmed. Fruit tree farming has declined greatly from its peak though fruit, especially dry fruit, is still considered important.

The data analysis revealed that the ceremonial crops are the most important. Almost all Hopi farmers plant corn; only 2.6% of all Hopi farmer interviewees do not plant corn. While all the respondents named corn as the most important crop, 45% named beans as their second most important crop, and 76% plant some melons for ceremonies as well. Many plant other crops are planted: 60% of interviewees plant beans, although, only 5% plant more than one kind of beans; 76% of interviewees plant gourds; 63% of interviewees plant pumpkin; 47% of interviewees plant chili; 44% plant squash; 7% plant leafy vegetables, such as spinach.

Other crops grown are oriented for home consumption. Family gardens were grown by 56% of those interviewed, however, another 20.5% would like to have gardens but do not at this time. Out of 77 farmers interviewed, 44 grow fruit trees (57%).

Of the fruit tree growers, 20 grow apples, 33 grow peaches, 11 grow pears, 4 grow plums, 21 grow apricots, and 7 grow grapes. Locally grown fruit is not sold, and is probably consumed by those growing it, since 57% of the interviewees grow fruit trees, 59% eat fresh fruit and 46% dry

fruit and eat it. Tree fruits have been an important part of the Hopi diet since peaches and other fruit arrived at the Mesas with the Spanish. The sweet fruit could be dried for use throughout the year. The production of fruit has declined from the peak of 2000-3000 acres that used to be grown here.

The farmers reported diverse strategies for preserving and enhancing the biodiversity of their crops. Seed for farming is not commonly purchased at the stores in town. A few farmers get their seeds at ceremonies (7.7%), some trade seed (7.7%), while 91% save seed from their crop to plant the next year. There is some controversy over whether or not seeds are changing; 28% of those interviewed said yes, seeds were changing, while 29% said no. Of those who believed seeds were changing, 31% claimed that seeds were becoming less resistant to insects. Many farmers transplant as well as plant seed, however, 37% said they do not transplant.

The year of the survey, 60% of those interviewed planted all their usual crops. The year before had been very dry, and some farmers were skeptical of having success, and may have reacted by planting less. Compared to mainstream farming, the farmers reported doing very little physically to ensure a good crop. However, farming traditions include a number of practices to protect against pests and utilize scarce moisture. Only 32% build windbreaks. Although the area is arid, and drought is a major obstacle to good results in farming, 72% of those interviewed do not harvest water, and only 24% want to do something to improve soil. Field sizes are from 1-3 acres in general. The interviewees do little experimenting: 79.5% always plant in the same fields; half do not experiment with size of field; 76% do not irrigate with only 4% belonging to an irrigation group (Moenkopi area). Pests are a problem and half of the interviewees try to control insects, and 67% try to control crows. A majority agree crows are worst pests (69%)

The fact that only two farmers were not farming corn and that the rest are, shows that farming remains a central part of Hopi life. However, times are changing as are people's occupations. The next part will cover some of the effects of technology, specifically the tractor, on Hopi.

Part Two

Tractor Usage – Need and Access

Tractors are now commonly used by many farmers on Hopi. They allow work to be done with less physical labor from individuals. They do save labor and are the results of changing social and economic situations for many Hopi. Opportunities for youth to participate in other activities during the farming season take labor away from traditional activities.

Tractor use is a modification to traditional Hopi farming methods that is becoming accepted and is widely used. Of those interviewed, 68% use a tractor to plant, 9% need a tractor but do not have access, and only 28% plant mostly by hand. Age appears to be a factor in finding access to a tractor. The interviewees under age 55 were successful at obtaining a tractor at a 62% level, while only 33% of those 55 and over were able to use a tractor. This was a close to significant difference, with chi square at $p=.055$.

While the traditional technologies used by Hopi farmers have been effective for over a thousand years, changing economic and social relationships have led to certain changes in Hopi farming

practices, particularly among younger farmers. Eighty percent of those under 55 used tractors, while 62% of those 55 and over used tractors. The chi square for this comparison was $p=.195$, not strongly significant, but still showing a fair discrepancy between age groups.

Those 55 and over have slightly higher percentages of responses in the following areas: would like to have a garden, but do not; need more help; are concerned about waste or growing more than is needed; believe Hopi values should be taught; farm completely by hand; believe that no action is possible to help farmers or want the tribe to help, rather than seeing that they can help themselves individually or in community groups.

Of those who claimed to have grown enough corn for their family, cross-tabulated with using a tractor showed that that 42% of tractor users do grow enough corn for their families, 28% of those who believe they need a tractor but don't have access to one grew enough food for their family, however, 41.7% of those who believed they did not need a tractor also grew enough corn for their families. This shows that factors other than tractor use must be entering in to lower production for older farmers. A comparison of those who did grow enough corn for their family, cross-tabulated with traditional spiritual ways of assuring a good crop with those who did not, indicated that the group claiming spiritual ways was more successful in the group that was sampled. The chi square for this comparison was .064, close to the p less than .05 value, but not statistically significant.

Access to a tractor was significantly different across mesa of residence for the interviewees: at First Mesa, 43.5% had trouble obtaining a tractor; at Second Mesa, 33% had trouble obtaining a tractor; at Third Mesa, 16% had trouble obtaining a tractor. The chi square value was $p=.041$, showing significantly more trouble obtaining a tractor on First Mesa. Not surprisingly, the difference of growing enough corn for one's family also differed significantly by village, and the difference here correlated to the areas which showed tractor difficulties by Mesa (chi square $p=.041$). A comparison by Mesa shows the same difficulty at First Mesa. Asked if they grew enough corn for their family interviewees responded: First Mesa, 65% did not; Second Mesa, 67% did not; Third Mesa, 48% did not. (not significant, chi square $p=.369$).

Section Three

Consumption & Processing

Because of the sacred motivation for these crops, norms against selling them are strong. However, 9% interviewed sell their crops off reservation and 11.5% sell their crops on the reservation. Less than half of those interviewed 51.5% of those under 55 and 29% of those 55 and over, did grow enough corn for their families, therefore many did have to buy corn: 16% said they purchase corn in the community, and 42% purchase corn outside the community. A very acceptable alternative to buying or selling corn is to give or receive corn as a gift. It was reported that 19% get corn from relatives. It is interesting that 91% of those interviewed said they give away part of their crop. It appears likely they give away part of their crop, even if they don't have enough themselves.

Shortages of a particular product such as blue corn do seem to induce people to buy-and-sell it. Twenty-five pounds of blue corn has reached the price of \$45.00 on Hopi. At times, people may

be forced to look off of the reservation for sources of blue corn. Attitudes towards buying and selling can be changed due to availability and need.

Hopi produce is grown for home consumption, and use in weddings and religious ceremonies: 96% cook and eat crops at home; 90% use crops for ceremonies; 88.5% use their crops for weddings. Although only 9% sell their crops off reservation and only 11.5% of the farmers interviewed sell their crops on the reservation, 16% said they purchase corn in the community, and 42% purchase corn outside the community.

A non-Hopi who married to a Hopi who cultivated a successful orchard of apples and peaches was widely criticized for selling the surplus rather than giving it away. As a result of these norms of gifting to those who do not have particular crops, projects that generate savings rather than income are more likely to be successful. The Hopis appear to have an intact system of distributing the locally grown surplus through time honored clan relationships.

Since 51.5% of those under 55 did grow enough corn for their family, while only 29% of those 55 and over grew enough, a very close to significant difference, with chi square at $p=.067$, one can conclude that elders are having some difficulty producing corn for their families. This may be a concern for food security programs in the future.

Bulk grinding is done to some degree by 51% of the interviewees, and 10% claims to do extensive bulk grinding. Hotevilla is the location where 50% of the participants take their corn to be ground. Others, 15%, grind their corn at home, 3% don't know where their wives grind corn, and 10% don't do any bulk grinding. This suggests that women probably have a better knowledge of post-harvest crop management. Their knowledge would be helpful input to questions regarding a corn-grinding business.

Section Four

Continuation of Farming – Next Generation

The sustainability of Hopi farming is a concern to many of those interviewed. There is some doubt about passing on the farming to the next generation. There is a minimal participation in teaching farming by aunts, mothers and grandmothers (10-11% total), farming is normally passed from father to son with help from uncles and grandfathers. However, as women were not interviewed, there may be distinct patterns by gender. A little over half the farmers interviewed saw obstacles to continuation of farming: 42% saw no obstacles for the continuation of farming for their household. Although 57% of those interviewed were taught how to farm by their fathers, and 43% by their grandfathers, only 33% believe their sons will farm the land after they are gone. Only 6 of the farmers interviewed have help planting their crops from people in the younger generation, only 2 had help caring for their crops from youth and only 5 had help harvesting from people in that age group. However, 77% believe that someone will farm after they are unable.

Section Five

Possible Actions

The farmers identified a variety of obstacles, most of which were relational rather than technical or environmental: 20.5% saw obstacle as lack of interest of the younger generation; 10% saw the obstacle being how people relate to each other in the community; 11.5% saw drought as an obstacle.

When asked what type of action they would personally like to see in response to farming difficulties: 44% of those interviewed said that the kind of action they would like to see is people getting together in communities to do something; 19% thought that the tribe or federal government should do something; 17% said that they believed that no action was possible. Many responded favorably to the suggestion that information be shared (28%), and expressed interest in working together if a community group was formed (51%). Only 11.5% were not interested in working together to find solutions. Most participants expressed a desire to actively teach farming by one method or another, either through the high school, community groups, or a community farm.

During the survey when the question concerning “*what should be done?*” was asked, most answers concerned more who should be doing something. Specifics as to what should be done were on the whole not very detailed. It might be that most individuals needed more time to think about the question.

Part Six

Processing of Data Analysis Meetings

During the discussion of the survey results, age groups, gender and modernization of farming methods were focus areas. The Representatives expressed desires to investigate some areas further. When examining the results, it became clear that the viewpoints and experiences of youth and women would add a lot to planning and executing agricultural-cultural programs..

An active discussion of modern farming practices versus the old planting by hand method ensued at the meeting for data analysis. It was noted by those present that people integrate modern technology with agriculture, but retain the spiritual belief. Tractors are used by 53 of those interviewed, while 7 interviewees would like to use a tractor but don't have access to one. Combining those two groups, totals 60 out of 77 interviewees who believe that tractor use is necessary. It is important to note that many of those that use tractors also use traditional plant methods. By combining the Cosmo vision of traditional practices with the meaning of use tractor use, a synthesis of traditional and mechanical farming practices is being developed in a manner that respects the rationale for the traditional ways. .

It was pointed out by one of the women Representatives that there is an assumption that people who use tractors are lazy. She commented however, that she had recently purchased a tractor herself, and that in reality, people with tractors have worked hard to get them, and may be less lazy than others who do not do extra work to purchase a tractor. Other modern methods of farming include building windbreaks and using various types of weed control and pest control.

All interviewees thought an active teaching of Hopi farming was important. A Community Farm was suggested by 34% of those interviewed when asked what might be done. Many desire community action, but the Hopi Representatives indicated that in the community there is Bear

Clan leadership for community farming activities. Something like a community farm would not be attempted without this leadership. However, the Representatives thought that the Sun and Sun Forehead Clan could help prompt the Bear Clan leaders to start a needed community action.

Leadership is difficult to find at Hopi, since leaders are often prescribed through religious belief and custom. Often, designated leaders do not provide enough leadership. The community history and belief is communal and there are social penalties for taking leadership when you are not the one who should.

The bulk grinding enterprise envisioned at the start of the project will need further research and community coordination. Further, women, who are the primary post-harvest actors, need to be consulted bulk grinding is reported by 51% of the interviewees, and 10% claims to do a lot of bulk grinding. In the youth-led study Pu'tavi conducted in the Charting Community Connections project, the possibility of village based corn grinding, for First or Second Mesa, appeared to be a feasible income generation project. It could reduce the costs of transportation for grinding corn and possibility free time. However, until we have a better understanding of whose time is involved and the actual additional costs of travel for grinding, it is not clear if this would be an endeavor that could generate the funds to repay a loan for the machinery, space for the endeavor, a salary for someone to run it, and depreciation and maintenance costs.

Project participants were led to conclude that the loss of Hopi values and the need for cultural education were paths that could possibly restore vigor and success to Hopi farming.

The Representatives agreed that further questions about Hopi farming would be of interest to the group and the community. Because of the importance of gender, age and mechanization of farming that emerged in the discussions around the Data Analysis, the Representatives and DNR staff suggested ways to develop further research. They suggested that a different sampling frame, to include youth and women, and more precise questions might be useful at this point in planning future action., Michael Ladeyo, Third Mesa representative in the survey, posed an important hypothesis a strong relation between age and possibilities of change.

Formative --10 year olds to 25 year
Interested --26-54
Unwilling to change-- 55 and over

The Representatives hope to continue to use PRA tools, such as drawings, maps, charts, time line, action plans, and PRA support for ongoing investigation of needs, plans and possible community actions for Hopi farmers. Identifying leaders and existing groups to take the results to in the community is the first step.

The University of Arizona College of Agriculture is an Equal Opportunity employer authorized to provide research, educational information and other services only to individuals and institutions that function with out regard to sex, race, religion, color, national origin, age, Vietnam Era Veteran's status, or disability.