

# SELF-SUFFICIENCY AND SUSTAINABILITY OF THE NATIVE POTATO CULTIVATION IN THE COMMUNITY OF QUILCAS, IN THE MANTARO VALLEY, IN THE CENTRAL ANDES OF PERU

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Farmers in the community of Quilcas, in the central Andes of Peru, grow native potatoes using techniques markedly different from those of modern agriculture. One important difference is that Quilcas farmers still plant varieties inherited generations ago, a practice that is possible only if they can minimize the degenerating effects of viruses. Potato yields decline steadily over several years, but Andean farmers discovered that seed coming from potatoes grown under low temperatures at the upper limits of agriculture has renewed vigour – an observation that led to a complex seed system whereby seed is constantly shifted between lower and higher altitudes. All 250 members of the Quilcas community have rights to potato lands in the highlands. A second difference is the extent of diversity. The 23 families surveyed grow more than 150 different varieties on their 35 ha of land, and this diversity gives this large potato area stability and resilience. The wisdom of giving land to many families is that each family will manage its seed differently. Each family grows its own particular mix of varieties. Nine varieties were dominant and almost all families grew these, but the average number of varieties managed by each family was 21 (range 14 to 41). A third difference between Quilcas practice and modern agriculture is that potato farming goes hand in hand with animal husbandry. Soil conservation and fertility are maintained by long rotations, linked to a pastoral system where herds of llamas, alpacas and sheep provide fertiliser for these amazing potato fields. A further difference is that potatoes are planted under a “no till” “*Tikpa*” system. The seed is placed in a hole dug by an Andean foot plow (*chakitaklla*) and then covered with a handful of manure. This system is crucial as it prevents erosion in terrain that often has over 80% gradient. The first hilling-up proceeds by turning the soil upside down, an operation done by a man-woman pair, where the woman upends the clod which the man lifts with his foot-plough. Fields are planted in “*chalo*” or Mixtures of varieties. Mixing varieties is the technique used to buffer the spread of diseases and the damage caused by frost, drought and hail, since all varieties differ in their ability to tolerate the distinct stresses, which may afflict the field in one or another year.

How has this system survived in the face of steady cultural and technical pressures to become integrated into modern society? One answer is that modern potato varieties do not grow well in the harsh conditions at high altitudes. Many modern varieties from plant breeding programs have migrated there, but they show no yield advantage and their quality is inferior to the much-appreciated floury native potatoes. So does this system have a future? With schools, communications and roads undermining the knowledge base required to maintain this system, its survival may be threatened. Changing our culture of disdain for the Andean to one of respect may give this incredible system a chance.