evaluation for tolerance to drought over three seasons (2014-2016) at five locations between 1,300 and 1,700masl with an average precipitation of only 295mm (range from 210 - 414mm - optimum 500mm), 15 clones yielded significantly higher than the existing varieties. Since three of those clones have been officially released as varieties (CIP392797.22, CIP398208.704 and CIP398190.200) in Kenya. Tolerance to drought and heat was expressed without yield losses at 15-20% less precipitation and 2-3 C° higher temperatures compared to climates favorable to potato production. Additionally, a series of adaptive participatory trials have been conducted in sub-Saharan African countries such as Tanzania, Rwanda and Ethiopia. This offers a reduced risk of losses due to climate change and offers farmers in mid-altitude an opportunity to integrate potato into their agro-food system to diversify production for improved food supply and income generation.

6. Physiological markers of tolerance to drought conditions in potato varieties (Solanum tuberosum L. Phureja Group). Knowing the physiological mechanisms of adaptation to climate change

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The potato crop is important worldwide, due to its contribution to food security. However, its yield is affected under drought conditions, one of the most important types of stress intensified by global warming. In this research, the physiological, biochemical and yield responses of four varieties of *S. tuberosum* L. Phureja Group under water deficit conditions were determined. Plants of varieties Colombia, Milagros, Paola and Violeta were subjected to two water supply treatments: water deficit applied at tuber initiation for 16 days, and continuous irrigation. The Colombia variety presented the highest susceptibility to the drought condition, due to the rapid decrease in the relative water content and stomatal conductance, the highest electrolyte leakage, the lowest values of F_v/F_m ratio, the highest yield decrease and therefore, the highest value in the drought susceptibility index. The results suggested that the Milagros variety is the most tolerant, because after 16 days of water deficit there was no decrease in yield and the variety obtained the lowest value in the drought susceptibility index. This may be due to the early increase in proline content that allowed it to make an osmotic adjustment and gradually decrease stomatal conductance. Therefore, less damage was observed to the cell membranes and photosynthetic apparatus due to the higher antioxidant activity. Knowing the tolerant varieties of potatoes under drought conditions, as well as the physiological mechanisms that promote this tolerance, allows us to generate breeding programs focused on obtaining plant materials that can be adapted to the climate conditions of the near future.

7. Assessment of the tolerance to low temperatures of native potatoes (*Solanum spp)*, in simulated conditions in La Molina, to mitigate climate change

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In the agro-ecological areas of the Peruvian Andes several adverse weather events occur that place agricultural production at risk. Frosts produce major losses in the potato crop. The high variability of native potatoes in the Peruvian highland constitutes the genetic basis to identify varieties with characteristics to withstand frost. This research was developed with the aim of identifying accessions of native potatoes with a tolerance to low temperatures in simulated conditions. Thirty accessions of the Communal Native Potato Germplasm Banks of the regions of Cusco, Puno and Apurimac were tested with four treatments T1: -4°C, T2: 0°C, T3: 4°C and T4: room temperature during a period of 2.5 hours. Prior to being tested at low temperatures, the phenological condition was recorded and the color of the stem, the thickness of the upper layer of tissue of the leaf, the number of stomas per area, the water content and the content of chlorophyll were evaluated. All accessions under study showed tolerance to temperatures of 0°C and 4°C, and only two of them showed tolerance to temperatures of -4°C, which were characterized by having a thicker upper layer of leaf tissue , a lower number of stomas per area, a lower water content, anthocyanin pigments in the stem and a higher content of chlorophyll. The methodology used can be taken into account to analyze the entire germplasm bank of native potatoes. The results can be used by plant breeders to develop varieties with a high genetic value.

Technical session B:
Trends in Potato Consumption and Market

1. Launch, growth and challenges of native Andean potatoes as we take them world-wide

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This essay discusses the history of native Andean potatoes in Ecuador, some of the reasons for its success world-wide when transformed into snacks, and the challenges ahead. In August 2010, with the support of CIP, we signed a contract between INIAP, CIP, Agropapa, and Inalproces that properly gave birth to the native Andean potato industry in Ecuador. The 2 varieties selected were Puca-Shungo and Yana-Shungo. Under our KIWA brand, these 2 varieties are exported today to over 30 countries, and the product has won several awards for innovation at major food shows around the world including Anuga, SIAL, and Gulf Foods.

More than anything, it shows the results of hard and collaborative work between development organizations such as CIP and IADB, the public sector represented by INIAP, farmers associations, universities like Stanford, and our company Inalproces. Working towards a shared common goal, we have been able to double productivity in the fields and increase income by at least 40% for farmers living at 3,000 meters above sea level and even higher. Moreover, these potatoes are the single best alternative in terms of cost-benefit for low-income farmers living above 11,000 feet above sea level (3,000 masl).