

EVOLUTION OF THE YIELDING AND COMBINING ABILITIES IN
ANDIGENA POTATOES AFTER SIX CYCLES OF RECURRENT
PHENOTYPIC SELECTION

A Thesis

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by

Francisco Juan Muñoz

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SUMMARY

Significant improvements were observed in the performance of 6 Adg sub-populations derived from a phenotypic recurrent selection process for adaptation to long day conditions. Gradual improvements were expressed for several attributes. A strong response to selection was observed for percent tuberization, total yield per plot, mean yield per plant, average tuber weight, percent of non-pigmented tubers and general external appearance. A somewhat weaker response was observed for total tuber number per plot and mean tuber number per hill. The largest gains were detected during the last stage of selection. At the population level, the earliest improvement in yield was the result of improving percent tuberization. Later gains came from improving yield per plant as well as steady improvement in percent tuberization. Selected Adg (Neotuberosum) resembled more the typical Adg rather than Tub with regards to several aspects including plant type, lateness, tuber number and external appearance.

Results from the combining ability studies indicated a gradual but conclusive improvement in the performance of hybrids as selection within Adg continued. The most advanced hybrids outyielded seven comparable Tub progenies and cv. Katahdin. Most of the variation among hybrids was explained by Adg alone and to a lesser extent by the Tub x Adg interaction. This indicated that a large amount of diversity was still present in the Neotuberosum stocks, despite selection. In addition, the results also suggested that the potential value of Adg could go far beyond the production of inter-group hybrids. Intra-Adg clones could be selected and released as commercial varieties in the future.