

Theoretical Statistics and Mathematics Unit

Monday Colloquium

Date : August 01, 2016

Time : 4.15 p.m.

Venue : L - Infinity, Stat-Math Unit (5th Floor, A. N. Kolmogorov Bhavan)

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Growth curve of Elephant foot yam under moderate to severe stress and plant sensitivity*

Abstract

Plant response sensitivity under stress is studied to maximise yam yield for different seed weights. Longitudinal growth of 60 Elephant-foot-yam is examined in a field experiment conducted in agricultural farm at Indian Statistical Institute, Giridih, Jharkhand (India) during 2015-16. Consider the stress from harsh agro-climatic environment with little manure, no weeding, and scanty irrigation as in sustainable agriculture in starting experiment. For some plants, in the middle of experiment, as a severe stress, underground yam and root structure is detached; remaining structures of stem attached with a few roots are replanted to continue experiment. Other plants are taken off the ground and yam volumes are measured by Archimedean principle, before replanting. Regular irrigation, manuring and weeding started around the time of first intervention. Subsequently, one more interim yam reading is taken by uprooting all surviving plants with care, before replanting for maturity. Yam growth under different stress and seed weights are computed from longitudinal growth via four possible readings on yam for each surviving plant. Almost sure confidence bands are constructed to cover growth curves with certainty. Seed weight 650g corresponds to superior growth, with sharp upturn of growth curve under severe stress. Detaching yam in the middle of experiment and replanting the remaining structure to continue experiment till full plant lifetime with seed weight 650g has significantly increasing effect on yield. Yam growth is higher due to plant stress, induced from interim yam detachment. The results are new. Interim yield plus final yield exceeds normal harvest under general stress.

I will also describe the sequence of events leading to this discovery.

*Accepted for publication in an International Journal

ALL ARE CORDIALLY INVITED