THE ECONOMICS OF RUSSET BURBANK SEED SIZE AND SPACING

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Abstract

This study is an economic analysis of Russet Burbank seed size and spacing data. Using a representative processor contract, regression analysis was used to estimate the statistical relationship between seed size and spacing and total yield, yield of U.S. No. 1's, yield of U.S. No. 2's, yield of 284 gm. and larger tubers, and adjusted grower returns. Depending upon seed cost, the economic optimum seed size ranges from 31 gm. to 48 gm. at 15 cm. spacing. With seed spacing at 23 cm. optimum seed size ranges from 40 gm. to 51 gm. At 31 cm., the optimum size range is 45 gm. to 53 gm. Grower returns adjusted for seed and harvest costs are estimated to be greater at the wider spacing.

The results of this analysis have been used to show how grower returns are reduced by variability in seed size and seed spacing. Under normal circumstances, reduced variability in both size and spacing could increase grower returns by $100 per hectare or more.

Resumen

Este estudio es un análisis económico de la información sobre el uso de diferentes tamaños de semilla y espaciamientos de la variedad Russet Burbank. Se usó un análisis de regresión para estimar la relación entre el tamaño de semilla, espaciamiento y rendimiento total, rendimiento de U.S. No. 1, U.S. No. 2, rendimiento de tubérculos de 284 y más grandes, y un valor de ganancia ajustada del agricultor. Dependiendo del costo de la semilla, el tamaño óptimo de semilla varía de 31 a 41 g al usar 15 cm de espaciamiento. Con espaciamiento de 23 cm el tamaño de semilla óptimo varió entre 40 g a 51 g. A 31 cm de espaciamiento el tamaño óptimo varió de 45 g a 53 g. El valor de ganancia del agricultor ajustadas para semilla y costo de cosecha, se estiman de ser mayores al usar mayores espaciamientos.

Los resultados de este análisis han sido usados para demostrar como las ganancias del agricultor son reducidas por variabilidad en el tamaño y espaciamiento de semilla. Bajo circunstancias normales, una variabilidad menor en tamaño y espaciamiento pueden incrementar las ganancias del agricultor en US$ 100 por hectarea o más.

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Introduction

The requirements of both the fresh and processed markets for potatoes demand increasingly sophisticated production techniques. Producing high yields alone will no longer guarantee grower returns greater than production costs. Today's potato grower must also produce potatoes of high quality in the appropriate sizes.

At the same time, potato research has become increasingly sophisticated. New information continues to be provided on all aspects of potato production, handling, and processing.

Production research results, in particular, can create conflicts for growers. Conflicts can occur when research results indicate that treatment effects cause different potato characteristics for which the grower is paid to move in opposite directions. How many U.S. #1 tubers can a grower give up to achieve larger size?

Where processing contracts are in use, it is possible to give the appropriate amount of emphasis to those characteristics affecting returns so that production practice recommendations will be consistent with maximizing returns.

Using data from previously published research, the objective of this paper is to show how research results can be combined with processing contract provisions to determine appropriate levels of input use. Here, seed size and spacing were analyzed to determine the direction and magnitude of effect on total yield, quantity of U.S. #1's, quantity of U.S. #2's, quantity of large tubers, and adjusted economic returns.

Materials and Methods

A complete description of the materials and statistical design of the original experiment is presented in (1). The purpose of that experiment was to measure the effects of seed piece size, seed spacing, and stem numbers on the yield of Russet Burbank potatoes in Washington. Seed size was grouped into five weight categories: 14 gm., 28 gm., 30 gm., 43 gm., and 57 gm. The 57 gm. category was separated into whole and cut seed. The third weight category (30 gm.) consisted of 14 percent 14 gm., 62 percent 28 gm., and 24 percent 43 gm. Seed piece spacings were 15 cm., 23 cm., and 30 cm. The distance between rows was 86 cm. There were six replications in 1970 and seven replications in 1971, a total of 234 observations.

In addition to the measurement of total yield in each replicate, data were also collected on specific gravity, amount of #1's, of #2's, of 284 gm. and larger tubers, and the yield of culls.

Adjusted Returns

From an analytic point of view, processing contracts generally provide a good description of those factors which increase or decrease grower