YIELD TRIALS AND ECONOMIC ANALYSES TO SELECT CULTIVARS FOR SALVAGE FOR SILAGE PRODUCTION

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Abstract

Potato (*Solanum tuberosum* L.) vine and tuber yield trials were conducted to identify clones that would produce large yields of vines and tubers at the same harvest date. PSDT 17 (a parallel spindle derived tetraploid) was the best yielding clone for all years when yield trials were performed. It produced 951 and 940 quintal/ha of tubers, and 35.5 and 42.6 quintal/ha of dry vines 135 days after planting in 1976 and 95 days after planting in 1977, respectively. PSDT 41 and Kennebec were very high vine and tuber yielding clones, but did not perform consistently across years. Yields for vines and tubers were larger in 1977 than in 1976 or, as previously reported, in 1975. Total economic returns were greatest for later harvests, since the tuber harvest provided most of the return.

Resumen

Se llevaron a cabo ensayos con el objeto de identificar clones capaces de producir altos rendimientos de papa (*Solanum tuberosum* L.) y follaje simultáneamente al momento de la cosecha. El clon PSDT 17 (Tetraploide 4x-2x, derivado de un cruce que produce gametos 2n por poliploidización unilateral) produjo los más altos rendimientos durante los años en que se efectuaron las pruebas. Produjo 951 y 940 quintales/ha de tubérculos y 35.5 y 42.6 quintales/ha de follaje seco, 135 días después de la siembra durante 1976 y después de 95 días desde la siembra en 1977, respectivamente. PSDT 41 y Kennebec alcanzaron altos rendimientos en follaje y tubérculos, esos clones, sin embargo, no rindieron consistente a través de los años. Los rendimientos de follaje y tubérculos fueron mayores en 1977 que en 1976 o los reportados anteriormente para 1975. El rendimiento económico total fue mayor para las cosechas tardías ya que los tubérculos produjeron la mayor parte del ingreso.

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1Research supported by the College of Agricultural and Life Sciences, University of Wisconsin, grants from the National Science Foundation (PCM 77-24330) and the International Potato Center, and a gift from Frito-Lay, Inc.

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Received for publication March 4, 1982.

KEY WORDS: Haulm, potato, ruminant animals, silage, *Solanum tuberosum* L., vine, yield trial.
Introduction

Utilization of potato (Solanum tuberosum L.) vines as forage has been investigated by Nicholson and coworkers (2) and D.E. Parfitt, S.J. Peloquin, and N.A. Jorgensen (in press, Amer. Potato J.). Potato vines appear to be a suitable feed for ruminants after ensiling. Vines could be cut and removed from the field to be ensiled for animal feed. The tubers would then be harvested and sold.

The premise behind vine and tuber yield trials is that cultivars can be identified which will produce large vine yields and large tuber yields at the same point in time (late in the growing season). A trial similar to the one described in the present study was performed in 1975 (3) and will be referred to in this paper.

Several high yielding clones (PSDTs 5, 17, 24, and 41) were identified in the 1975 trial. These clones outyielded the standard cultivars in the experiment for both vines and tubers. A description of PSDT clones (parallel spindle derived tetraploids) and their origin is given in a publication by Mok and Peloquin (1). PSDT clones 5, 24, and 41, as well as Russet Burbank and W729R, were late maturing; they produced large tuber yields 120 and 135 days after planting and yielded large amounts of green vines on the same dates.

The yield trial in 1976 was undertaken to test high yielding clones from the 1975 trials. In 1977, new materials were included in the experiment, as well as clones that had been tested in 1975 and 1976.

Materials and Methods

Eight clones were planted in three blocks for the 1976 experiment. Four replications of the experiment were planted within each block so that four different harvest dates could be tested. The eight clones that were tested in 1976 were also evaluated in 1975. In 1977, Superior was dropped from the yield trial and nine other clones were added. Four blocks were planted and two harvest dates were selected. All of the clone x harvest date treatments were randomized within the blocks.

Nine hills were planted for each treatment unit (clone x harvest date) in 1976 and 1977. Russet Burbank check rows were planted between treatment rows to prevent an early harvest in one row from affecting adjacent treatments that were scheduled to be harvested later.

Yields were calculated on a per hill basis and were transformed to quintals per hectare. Separate analyses of variance were computed for dry vine yields, and tuber yields at each harvest. Clones were considered to be fixed.

The results were also expressed in terms of the economic values of the vines, tubers, and vines + tubers together. The economic values of vine yields were calculated from the equation: \((0.18 \times \text{(fresh vine yield - dry vine yield)} + \text{dry vine yield}) \times 2.50 = \text{value}\). This formula represents the weight of