ON-FARM EVALUATION OF POTATO PLANTER PERFORMANCE

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INTRODUCTION

Potato planter performance and seed evaluations play very important and dynamic roles in potato yield and quality. Potato plants tend to rapidly fill in the blank spots, masking the effects and below ground behavior of poor stand that result in undersize tubers and lower the overall yield. For the past twenty years, the University of Idaho Elmore County Extension Educator, in cooperation with growers and industry, has conducted ongoing evaluations of potato planter performance, seed evaluation, and has demonstrated the positive impacts of higher planter efficiency and seed size and quality on potato yield and quality.

METHODS

Potato planter performance was evaluated by seed spacing, planter speed, and seed depth. Seed pieces in a 25 ft of row were uncovered, counted, and the spacing between the seed pieces was measured. Distances were categorized as: under spaced (0-7 in); acceptable (8-12 in); or over spaced (>12 in). The number of spacings in the acceptable range was divided by the total and multiplied by 100 to get percentage planter efficiency (Table 1).

Seed evaluations included seed source, disease, treatment, cutting, and the seed cutter performance. Seed samples were taken from the seed lot being used by the grower cooperator to evaluate seed cutter performance. Factors taken into consideration included the growing environment of the seed crop, seed storage, present seed condition, seed germination and physiological age, and seed size distribution (Tables 2, 3).

RESULTS AND DISCUSSION

In the evaluations, 8 to 12 inches was used as the optimum range, but seed piece spacing just an inch or two above or below the optimum range will still produce acceptable results. A substantial number of spacings measured fell into the category of slightly less or greater than optimal, but were close enough to produce good yields of high quality potatoes. The results of planter performance evaluations from 1988 through 2005 remain consistent, and demonstrate the importance of planter speed for achieving good planter performance (Tables 4,5,6,7). It has been demonstrated that relatively small decreases in planter speed result in large increases of seed pieces spaced in the desirable range of 8-12 inches.

Presented at the Idaho Potato Conference on January 18, 2006.

Based on our growers data, since 1988 planter efficiency has increased from 32% to as high as 98%, with an average of 77% (Tables 8–13). The Extension Office and growers recorded yield increases ranging from 15 cwt to 120 cwt per acre as a result of increased planter efficiency. There was a general consensus among growers that higher planter efficiency resulted in more uniform potatoes. Dr. Corsini in Aberdeen reported that higher planter efficiency results in more uniform stands and less disease.

FURTHER READING:

Iritani, W.M., and R.E. Thornton. 1984. Potatoes: Influencing Seed Tuber Behavior. PNW 248. 15pp.

Seyedbagheri, M.M., M. Thornton, and M. Larkin. 1995. Efficient Planter Performance Adds to Potato Profits. Proceedings of the Winter Commodity Schools. 27:127-32.

Seyedbagheri, M.M., J.M. Torrell. 2000. Improved Management of Potato Planters and Potato Seed Cutters. Proceedings of the Winter Commodity Schools. 32:99-104.

Table 1: Effectiveness of Planter's Spacing of Seeds

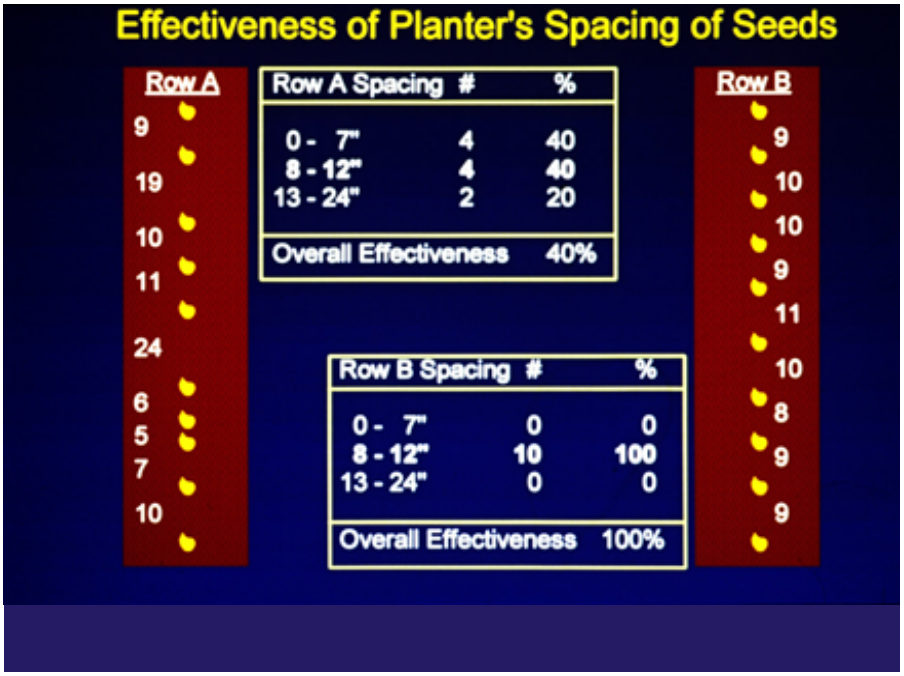

Table 2: Seed Cutter Performance

Table 3: Seed Cutter Performance

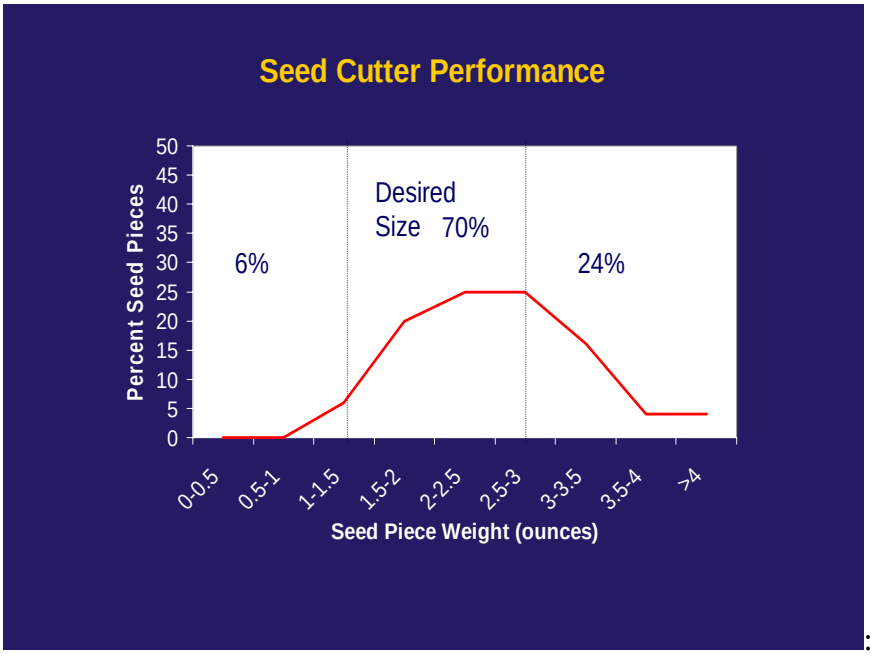

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Table 4: Planter Speed Calculation Formula

Planter Speed Calculation

1. Actual Planter Speed

$$\frac{\text{ft. traveled}}{\text{sec. traveled}} \times \frac{\text{1 mile}}{\text{5280 ft.}} \times \frac{\text{3600 sec.}}{\text{1 hr.}}$$

$$= \frac{\text{ft. traveled}}{\text{sec. traveled}} \times .682 = \text{mph}$$

Table 5: Planter Speed Calculation - Ex. 1

Planter Speed Calculation

Example 1:

Traveled 100 ft. in 23 sec.

$$\frac{100}{23} \times .682 = 3 \text{ mph}$$

Table 6: Planter Speed Calculation – Actual Planter Speed

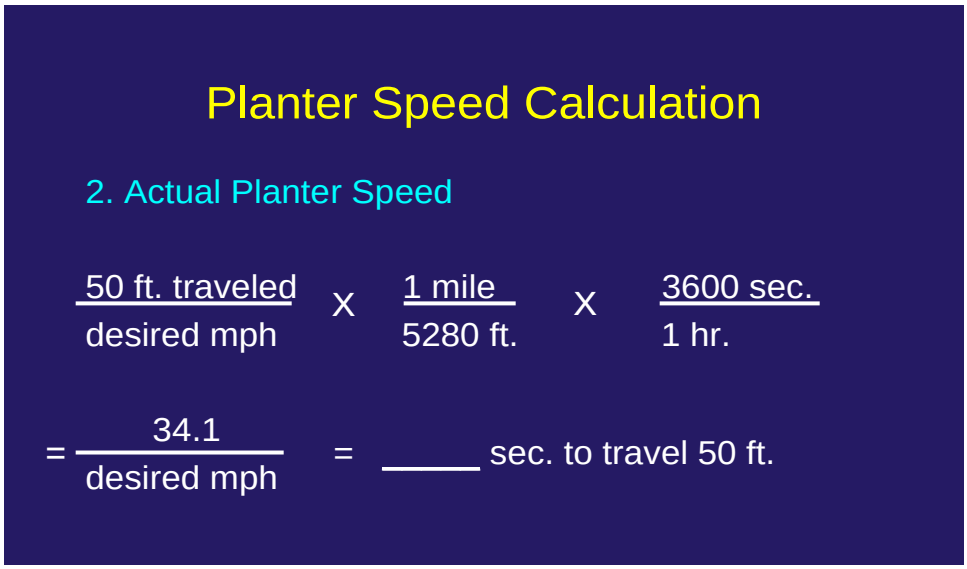

Table 7: Planter Speed Calculation – Ex. 2

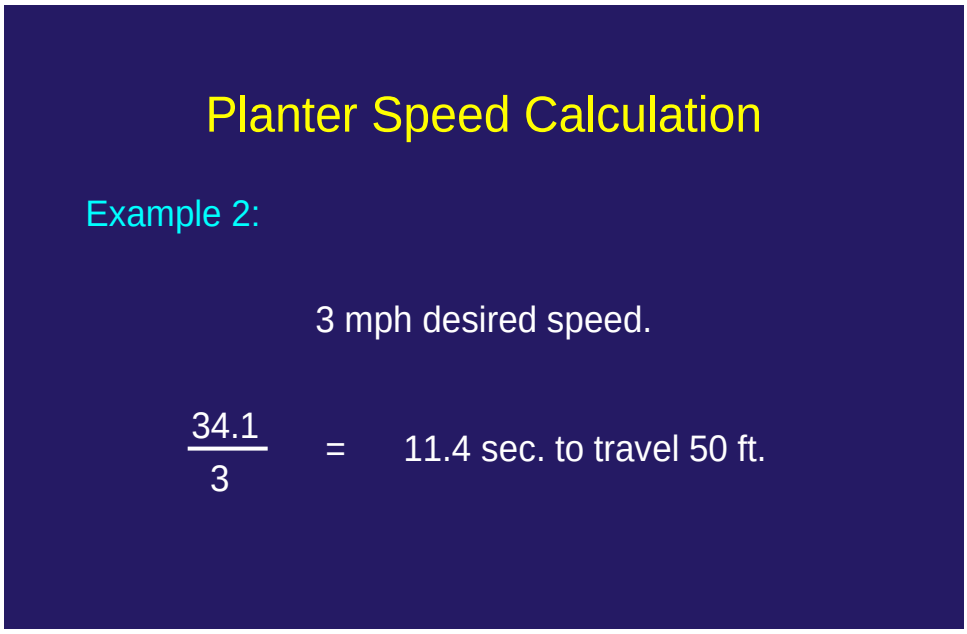

Table 8: 2001 Planter Performance 3.9 mph 3 Randomized Rows

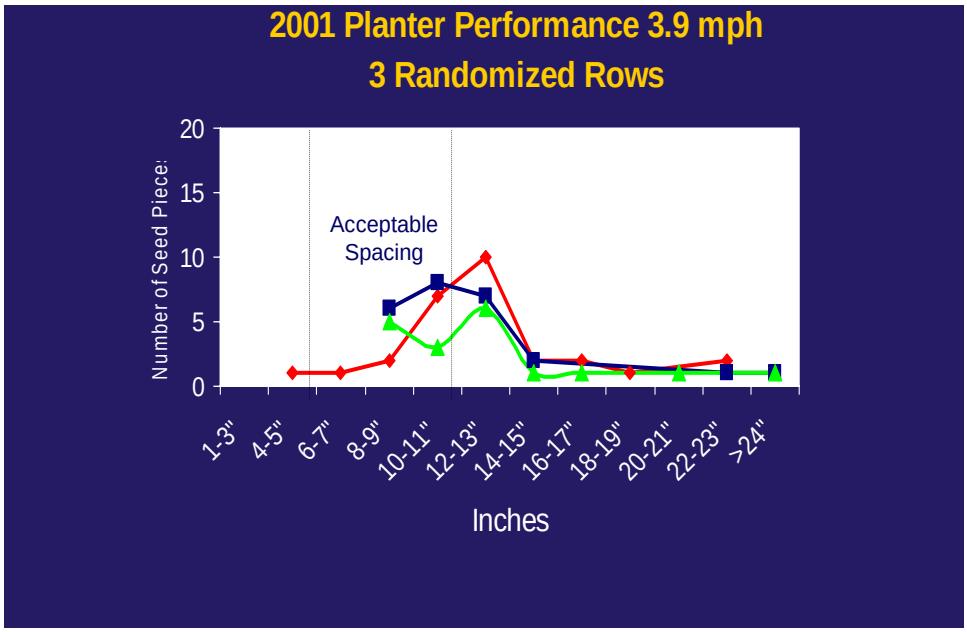

Table 9: 2001 Planter Performance
Blue Row 4.8 mph Red Row 5 mph

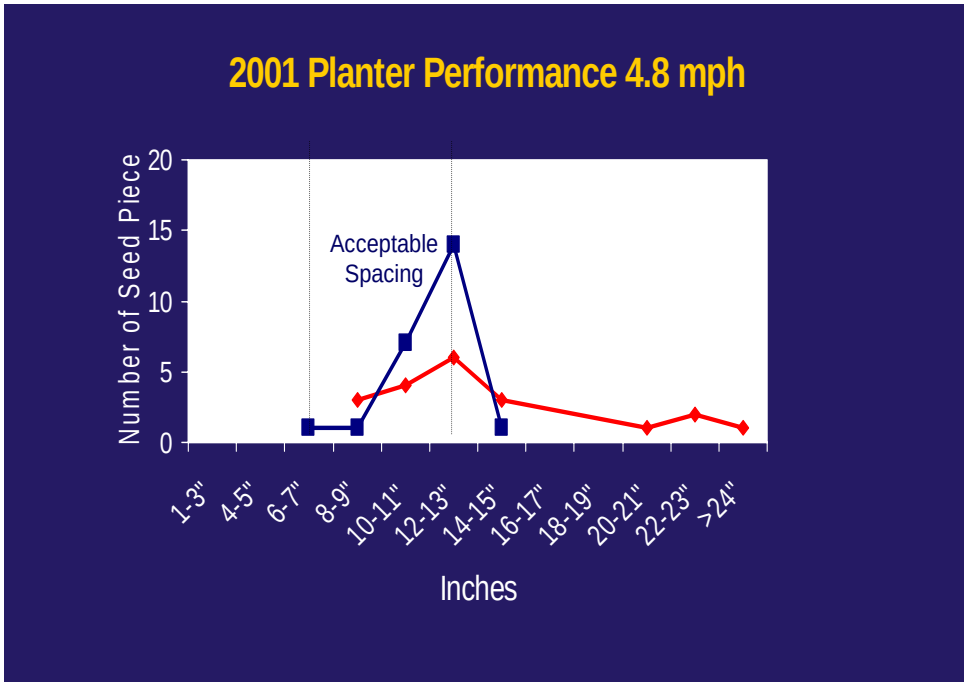

Table 10: 2003 Planter Performance Glenns Ferry

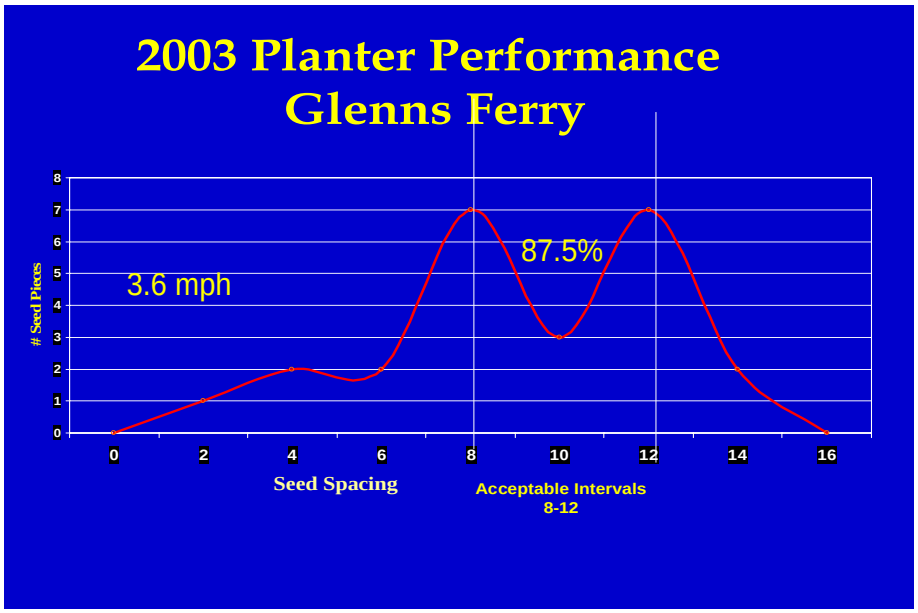

Table 11: 2004 Planter Performance Glenns Ferry

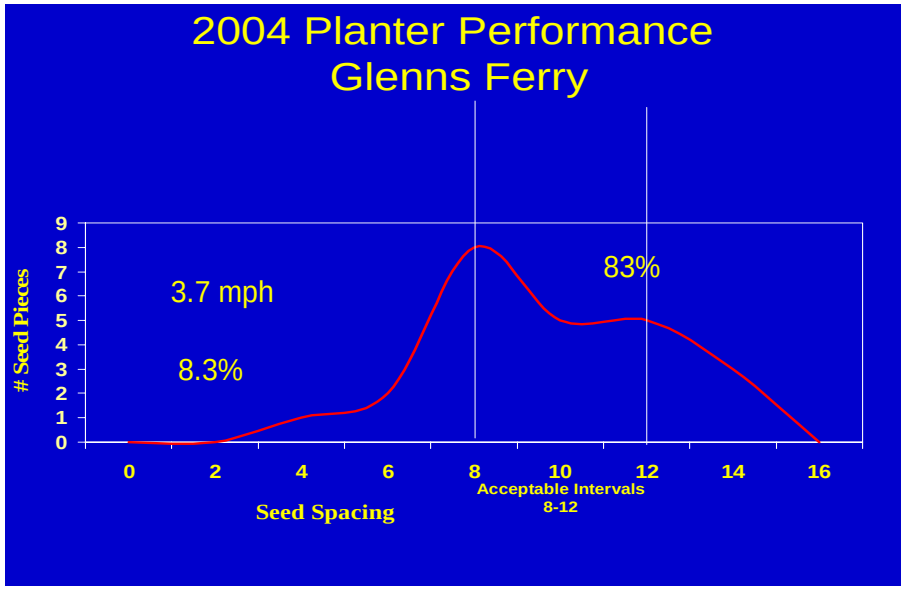

Table 12: 2005 Potato Planter Performance Indian Cove

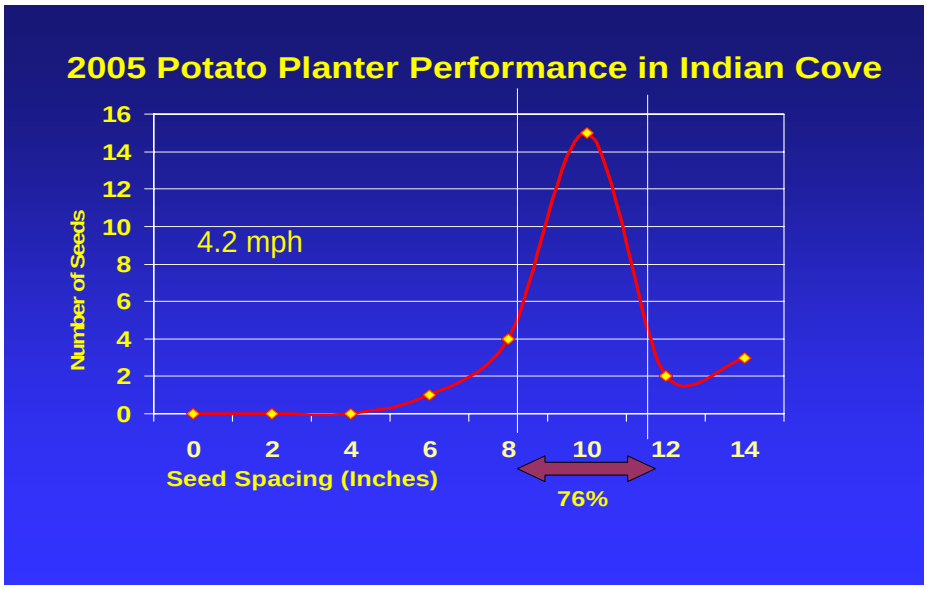

Table 13: 2005 Performance after Adjustment in Grand View