2-PASS CHALLENGE WEED CONTROL RESULTS

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Introduction

A single pass herbicide program has become the goal of many corn producers throughout the state. The apparent time and cost savings in controlling weeds with a single pre or post-emergence herbicide application is the driving force behind this trend. While there are situations where a single pass strategy will work, it has weaknesses that can result in inconsistent performance. Some single pass pre-emergence programs sacrifice control of large seeded broadleaves and perennials, and many are strongly influenced by the timing of rainfall. New chemistries, increasing no-till acreage and increased use of herbicide resistant crops have resulted in a number of single pass post-emergence herbicide programs. Although this provides the opportunity to scout and select herbicide programs to best match weed spectrum, timing is critical for effective control. Since most fields contain several problem weed species, timing a single application to effectively control all species can be difficult.

Is a two-pass herbicide program the answer? Maybe. When questioned, most farmers and agronomists will agree that a two-pass herbicide program provides more consistent weed control over a greater number of conditions. So why aren't they using a two-pass program? Cost and time are cited as the two main factors. In today's tight farm economy, many are willing to sacrifice some level of weed control in an effort to save money.

Objective

Investigate the efficacy, cost effectiveness and risks involved with two-pass vs. one-pass weed management programs in corn. Although two-pass programs are considered more expensive due to increased application costs, can a two-pass program provide improved crop safety, increased weed control, and ultimately increased yield to out-weigh the increased application costs?

Materials and Methods

Evaluation was accomplished through on-farm, split field comparisons of one-pass vs. two-pass corn herbicide programs. On-site coordinators (crop advisors, county agents, and others interested in the project) were contacted to identify grower cooperators and carry out implementation of the field trials. No restrictions were placed on herbicides allowed, to encourage grower participation. A burn-down herbicide in no-till systems was allowed and is not considered to be one of the herbicide applications in either the

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single or two-pass program. Any of the following herbicide application schemes were acceptable (any single pass program vs. any two-pass program):

Single-Pass	Two-Pass
1 PPI	1 PPI + 1 POST
1 PRE	1 PRE + 1 POST
1 POST	1 PPI (reduced rate) + 1 Cultivation
	1 PRE (reduced rate) + 1 Cultivation
	1 POST + 1 Cultivation

Minimum field size for participation in the trial, was 5 acres, with larger field sizes preferred. Although replication was not a requirement, it was strongly encouraged. All yield and crop management data was collected by the on-site coordinator. A single weed control rating for both weed management programs was taken during August.

Results and Discussion

Twenty five locations were entered into the trial at the beginning of the 2002 season with eight locations failing to set up their trials due to time limitations. None of the participating locations required additional herbicide rescue treatments for either the single or two-pass programs. A wide range of herbicide and/or cultivation options were chosen by the participants. A summary of the yield and associated weed management costs can be found in table 1. Weed control costs are based on the actual herbicide applications

Table 1. Yield and weed management costs of 1-pass and 2-pass weed control programs.

Trial #	1-Pass Yield (bu/a)	2-Pass Yield (bu/a)	1-Pass Weed Control Cost($/a)	2-Pass Weed Control Cost($/a)	Net Gain of 2-Pass Program ($/a)
1*	86.5	117	38.7	45.7	54
2	137.4	143.4	26.62	33.62	5
3	199.1	208.5	33.35	38.28	13.87
4	161.3	158.9	33.26	53.54	-25.08
5*	122.8	123.7	45.07	33.18	13.69
6	158.8	159.3	42.19	48.76	-5.57
7	130	127	46.24	68.5	-28.26
8*	164.6	172.8	45.49	52.49	9.4
9*	105.73	102.28	34.42	41.42	-13.9
10	161	165	26.71	40.1	-5.39
11	171.6	172.3	37.98	50.83	-11.45
12	151	159	27.84	35.44	8.4
13	169	187	27.84	32.67	31.17
14*	90.3	131.5	21.34	28.34	75.4
15	90.3	98.2	21.34	41.25	-4.11
16	117	118	38.56	46.31	-5.75
17	160	159	44.35	42.14	0.21

*Locations utilizing cultivation as part of their 2-pass weed control program.

supplied by participants. Herbicide prices were utilized from the Appendix Table 3 - herbicide price list found in the UW Extension Publication A3646 Pest Management in Wisconsin Field Crops. An average herbicide application cost and cultivation cost of $7 / acre was used uniformly for all locations. Corn was priced at $2 / bu for comparison purposes. From table 1, the column labeled net gain of 2-pass program indicates whether any advantages of a 2-pass program were realized as a financial gain. A negative number in this column represents a net loss per acre when using the 2-pass program vs. the 1-pass program. Conversely, a positive number represents a net gain. Several of the largest net gains are associated with locations which utilized cultivation as part of their 2-pass program. Trials # 1 and 14 experienced very large yield gains which were likely more of a result of the benefits of cultivation, rather than improved weed control. Several trials without cultivation experienced modest yield increases of 7-10 bu/a when using a 2-pass weed management program. These yield increases were more than enough to cover the increased application costs and provide a net gain from a using a 2-pass program. However, all of the locations experiencing a net gain experienced roughly the same level of weed control between the 1-pass and 2-pass programs. It would appear that most of these yield differences were due to improved crop safety. Additional trials will likely be conducted during the 2003 growing season. More locations and growing conditions will provide a clearer picture as to whether a 2-pass program provides clear benefits in a weed management program.