

NORTH WEST DIRECT SEEDING SURVEY

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Objectives

The objectives of the direct seeding survey were to evaluate producer adoption of direct seeding practices and to assess the information needs of producers trying to direct seed.

Background

Direct seeding was promoted as a soil conserving practice under the Canada-Saskatchewan Save Our Soils (SOS) Program. SOS direct seeding workshops were held at 14 towns in the NW Region during the winter of 1993. 298 surveys were mailed to participants in the fall of 1993. The survey package also contained a stamped self-addressed envelope and participants were told they would be entered into a draw if they returned their completed survey. The draw was for a free husband & wife registration to the 1994 SSCA Direct Seeding Workshop at Lloydminster, valued at \$90.00. 184 (62%) of the producers responded to the survey. Most surveys were mailed back once completed. Rural Service Center client service reps made some follow-up phone calls to remind participants to send in the surveys. Participants were also offered the option of completing the survey over the phone.

The survey was composed of two parts. The first part asked about cropping practices and equipment used. The second part asked about direct seeding experience. The survey was 4 pages long.

The definition of direct seeding used was:

"Direct Seeding is a production system where the crop is seeded into standing stubble without any preseeding tillage. This can range from zero tillage when the crop is seeded with minimal soil disturbance to seeding with air seeders and sweeps. The system can include fall fertilizer banding with narrow knives (low soil disturbance)".

The completed surveys were entered on an Access database. PFRA Policy & Analysis Division utilized the database to analyze the information and do cross tabulations of the survey data.

RESULTS AND DISCUSSION

Response: 184/298 (62%) responded to the survey.

Cropping Practices

On average, respondents cropped 1362 acres, and fallowed 166 acres. The maximum amount of acres cropped 4700; the minimum 132. The maximum acres of fallowed was 2500; the minimum was 0.

124 respondents grew wheat, barley and canola. 100 grew cereals, oilseeds and pulses. 72 grew cereals and oilseeds. Only 8 grew cereals only. Most respondents (95%) are growing a variety of cereal and broadleaf crops in their rotation.

Seeding Equipment

140 respondents use air seeders or air drills. Some of these respondents used more than one type of seeding equipment. Overall, 63% of the seeding equipment used was air seeders or air drills, based on the total number of seeding equipment used by respondents.

The types of openers used for seeding were: sweeps, 47%; discs, 20%; hoes, 17%; knives, 15%; and other, 1%. Therefore, 47% used a high disturbance (sweeps) seeding system while 52% used a lower disturbance (discs, hoes, knives) system.

Residue Management

Managing crop residues is essential for direct seeding systems. Spreading crop residues at harvest was done by 58% of respondents on all their cropped land. 29% spread residues on some of their cropped land. Only 13% did not spread crop residues on any land.

Tillage

Fall tillage was not used on any acres by 64% of respondents. Only 4% of respondents used fall tillage on all of their acres. 32% of respondents used fall tillage on some acres. The average number of fall tillage operations was less than 1 (0.43) while 2 was the maximum number of operations, and 0 the minimum.

Spring pre-seeding tillage was done by 27% of respondents on all their acres. 53% of respondents did spring pre-seeding tillage on some of their acres. 20% did no spring tillage. The average number of spring tillage operations was 1.2. Three passes was the maximum, 0 the minimum.

Spring pre-seeding tillage was more common (80% of respondents did at least some) than fall tillage (36%). Most of the tillage operations appear to be necessary for fertilizer application.

Herbicides

Most respondents (64%) did not use fall surface applied granular herbicides without incorporation. 32% used some, 4% used surface applied herbicides on all their acres.

Most respondents (60%) used soil incorporated herbicides on some of their acres; only 1% on all acres. 39% did not use soil incorporated herbicides.

84% of respondents did not use any herbicides for fall winter annual weed control. Only 16% used herbicides for fall winter annual weed control on some of their acres. Spring winter annual weed control was more popular. 36% used winter annual weed control in the spring on some of their acres; 18% on all acres. 46% did not use any winter annual weed control in the spring. Are winter annuals not a problem or are they being controlled with a pre-seeding burnoff? or tillage? At least 30% of respondents are not using herbicides to control winter annuals.

54% of respondents are using Round-Up or Rustler to get a pre-seeding "burnoff" of weeds on some of their acres. 15% are using this practice on all their acres. 31% are not doing a pre-seeding burnoff at all. About an equal number of respondents use winter annual control (70%) as do pre-seeding burnoff (69%).

Packing

40% of respondents harrow-pack after seeding on all their acres. and 24% harrow-pack after seeding on some of their acres. 36% did not harrow-pack after seeding.

43% of respondents used on-row packing, 52% used coil packing, 5% used some other form of packing such as rollers for lentil production.

Fertility

27 respondents fall banded, 17 fall banded with knives (low disturbance), and 10 fall banded with sweeps (high disturbance).

93 respondents fertilized in the spring in a separate operation from seeding. 42 spring banded with knives and 51 spring applied their fertilizer with sweeps.

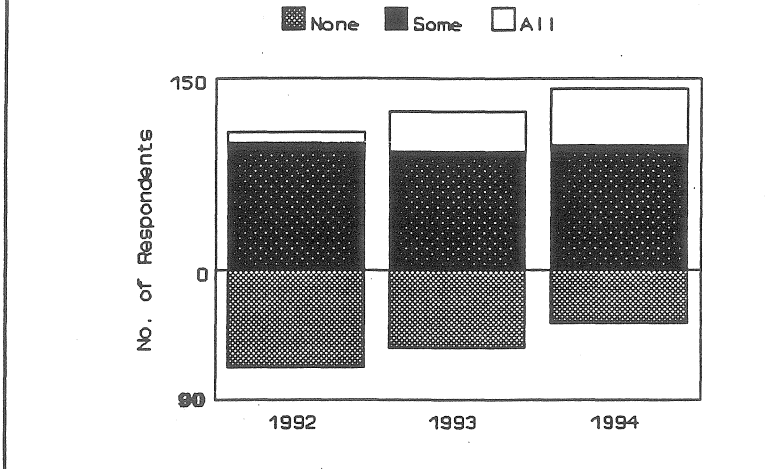
134 respondents seed placed their fertilizer, and 25 side banded during seeding. 22 respondents broadcast their fertilizer. Two foliar applied fertilizer on some of their acres.

Cross tabulations of the data suggest that a high percentage of direct seeders applied some fertilizer in a separate operation. Only one respondent seed placed all fertilizer during seeding on all their acres.

Direct Seeding Trends

108 producers direct seeded some or all of their acres during or prior to 1992. 124 producers direct seeded some or all of their acres during 1993 and 142 plan to direct seed some or all of their acres during 1994. The trend is that the number of producers willing to try direct seeding has increased 13% each year.

Figure 1 No. of Respondents Who Direct Seeded None, Some, or All Acres in 1992 & 1993, and Planned Acreage for 1994



During and prior to 1992, 8 of the producers surveyed had direct seeded all their acres. That number increased 4-fold during 1993 to 31 producers. 44 producers surveyed plan to direct seed all their acres in 1994, an increase of 42% over 1993.

37 of 184 producers (20%) surveyed had tried direct seeding as a Save Our Soils demonstration. This survey did not attempt to assess the impact of SOS demonstrations on the

adoption of direct seeding.

Years of Direct Seeding Experience

Participants were relatively inexperienced at direct seeding. 28% have no experience and 65% have less than 5 years of direct seeding experience. The remaining 7% had greater than 5 years experience.

Direct Seeding Equipment

Air seeders or air drills are the most popular type of seeding equipment used by respondents who direct seed some or all of their acres. Twenty-six out of 31 (84%) respondents who direct seed all their acres use an air seeder or air drill.

Of all respondents using air seeders, 59% use sweeps for openers which is a high disturbance method of seeding. In contrast, 75% of producers who direct seed all their acres with air seeders or air drills use a minimum disturbance opener (knife, hoe, disk).

Direct seeders are encouraged to use narrow openers and on-row packing systems. The minimal soil disturbance can reduce weed seed germination. On-row packing ensures good seed to soil contact which promotes germination and emergence. Unpacked soil between the rows remain loose and is an unfavourable environment for weed seed germination.

A high percent of producers (80%) who direct seed all their acres with air seeders use on-row packing. Producers who direct seed only some of the their acres favoured coil packing (61%) on their air seeders.

52% of producers purchased their direct seeding equipment. 33% modified existing equipment while 13% rented or leased equipment. Only 2% borrowed direct seeding equipment.

Problems experienced by those who had tried direct seeding

Producers were asked about problems that they had encountered when direct seeding. Residue management was the number one response, followed closely by soil temperature/germination problems and weed control. Fertilizer placement, field conditions (roughness, wet soil), seed placement & seed depth, hairpinning, and seeding equipment penetration were common problems as well. Less common problems encountered were stones, late maturity, crop rotation, row spacing, and moles.

Barriers to Direct Seeding

Twenty-three percent of producers who didn't direct seed in 1993 had a wait and see attitude. They are watching their neighbours who are direct seeding and may adopt the practice if their neighbours are successful. Twenty-two percent cited financial constraints as a barrier while 20% were waiting for the time that they needed to replace machinery. Twelve percent said that they needed to purchase residue management equipment first. An equal percentage (12%) said that their residue was not spread in the fall of 1992.

Eight percent were in the process of equipment modification. Only 3% of the 135 respondents said that they did not plan to direct seed.

The survey also asked for additional reasons for not direct seeding. A wide variety of reasons were given, however soil temperature was the only response given twice. Better seed openers, too much trash, soil conditions, hard packed fields, and grasshopper concerns were some of the responses.

Information Needs

Although a high percentage grew a wide variety of crops, 28% responded that they needed more information on crop rotations. 25% wanted more information on weed control, while 17% and 16% asked for more information on seeding equipment and soil fertility, respectively. Even though residue management was the number one problem experienced during direct seeding, only 14% required more information. This could suggest that while farmers experienced problems with residue management, the information provided was considered adequate to solve this problem.

Additional write-in comments were solicited. Economic information was requested by 3 individuals. Information needs requested twice were seeding depth, soil temperatures, modification of existing

equipment, surface applied chemicals with no incorporation, gopher/mole control, and sod seeding grass. Row spacing, packing systems, and the effect of direct seeding on soil properties were requested one time each.

Conclusions

Direct seeding trends from this survey confirm the growth in the adoption of this practice. The percent of those direct seeding at least some of their acres increased 13% from 1992 to 1993 and is projected to grow by the same percentage in 1994. The number of producers direct seeding all their acres grew from 8 producers in 1992 to 44 producers planning to direct seed all their acres in 1994. This means that 24% of the participants plan to direct seed all their acres by 1994.

A high percentage of the participants who participated in the direct seeding workshop grow a combination of cereal and broadleaf crops. Also, they practice a minimum amount of tillage. High disturbance seeding systems are common. Most of the research done compares zero-tillage and conventional tillage. Perhaps future research and demonstrations should compare minimal and high disturbance direct seeding systems. This type of information could provide for further adoption of minimal disturbance direct seeding. Extension efforts will have to emphasize the advantages of minimal soil disturbance.

The majority of those producers direct seeding all their acres follow the recommendations of a low disturbance method of seeding with on-row packing systems.

Germination and emergence concerns will have to be alleviated for further adoption. Future surveys will have to identify type of weed control information required. Residue surveys may be beneficial to see if producers are managing that problem. Most of the tillage operations appear to be necessary for fertilizer application. Fertilizer application in one pass seeding systems continue to be a barrier to adoption.

More surveying in the future would be useful to monitor trends and information needs. Only then can adequate extension programming be undertaken. Many of the information needs outlined in the survey will be addressed in regional programming under the Canada-Saskatchewan Green Plan Agreement.

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Key topic is direct seeding - producer experience
trends
problems
information requirements