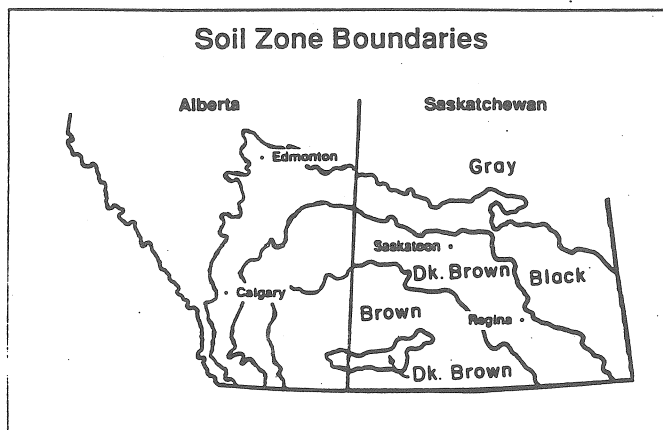
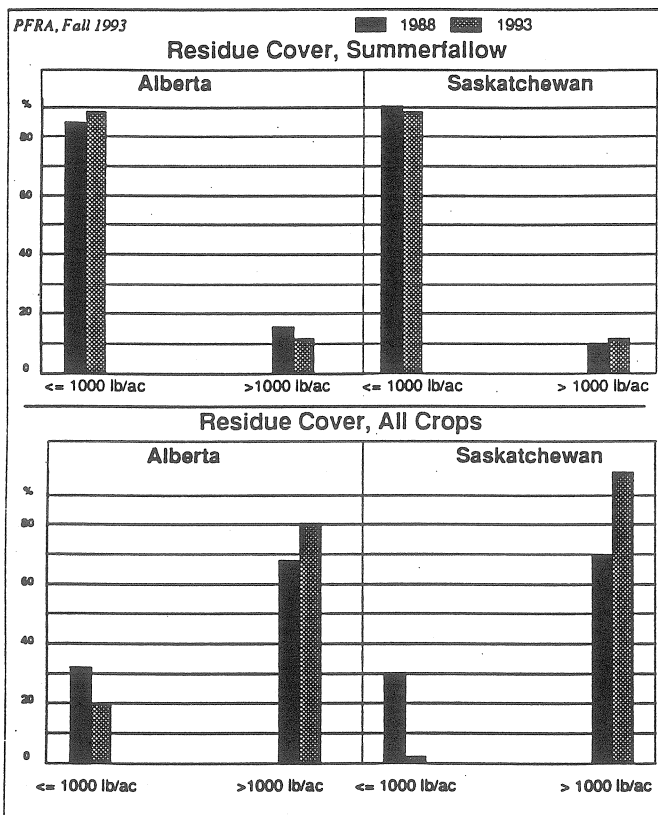


More Residue on Stubble

An increase was seen in the amount of residue on cereal and oilseed crops. In 1988, approximately 70% of the cereal fields in both Alberta and Saskatchewan had more than 1000 lbs/ac of residue. In 1993, cereal fields with more than 1000 lbs/ac now represent 81% and 98% of the surveyed fields in Alberta and Saskatchewan, respectively. However, 88% of summerfallow fields in 1993 in both provinces have less than 1000 lbs/ac of residue cover. This represents a slight increase in Alberta and a slight decrease in Saskatchewan. In both cases, there are very low amounts of residue on summerfallow.



Conservation Tillage Catching On

The trend towards reduced tillage is evidenced by more fields with standing and partially standing stubble, more residue on cropped fields, and more forages.

In Saskatchewan, there is a reduction in the number of summerfallow fields with flat residue. There are more fields with partially standing residue on these fields, which provides better erosion protection than flat residue. In both Alberta and Saskatchewan there are more stubble fields with standing residue due to less fall tillage. Standing residue provides the best erosion protection and traps snow throughout the winter.

The majority of summerfallow fields are still at risk to erosion however, due to low residue levels. Summerfallow acreage decreased by 8% between 1988 and 1993, however the amount of residue on summerfallow is virtually unchanged. Stubble fields appear to have sufficient levels of residue to protect against erosion next spring.

Of the more than 3200 sites surveyed again in 1993, approximately 8% have converted to forages. About half of this increase in forages is in the drier regions of Alberta and Saskatchewan, offering more erosion protection in these areas. The other half is in the Black and Grey soil zones in both Alberta and Saskatchewan, and is part of the extended rotations used in that area.

In Alberta there is a trend from less cereal production to more oilseeds and pulses. In 1988, 61% of the sites were in cereals, while in 1993 this has dropped to 55%. In Saskatchewan, the number of fields in cereals increased slightly from 50% to 53%, and there are more oilseeds and pulses. In both provinces there is a marked decrease in winter cereal acreage.

For more information on land use and land management contact your local PFRA District Conservationist:

Alberta and BC

Lethbridge	327-4340
Medicine Hat	526-2429
Hanna	854-4448
Red Deer	346-9060
Vegreville	632-2919
Peace River	624-3386
Westlock	349-3963
Dawson Creek	782-3116

Saskatchewan

Swift Current	778-4200
Moose Jaw	691-3370
Weyburn	842-4624
Melville	728-5790
Watrous	946-3303
Rosetown	882-4272
North Battleford	445-6217
Melfort	752-4442



Crop Residue Cover in Saskatchewan

Survey Conducted in Fall 1993

Keeping fields covered with crop residue is the cheapest and most effective way to protect fields against both wind and water erosion in Saskatchewan. The amount of crop residue required to control erosion depends on the type of soil being farmed and the steepness of field slopes. The type of crop residue is also very important. Cereal residues offer more protection against erosion because there are more stalks per acre, the stubble is generally quite long, and cereal residue breaks down more slowly than oilseed and pulse residue. At least 1000 lbs/ac of cereal residue (equivalent to 50% cover, flat cereal residue) is recommended to protect fields from wind and water erosion (see photos on reverse).

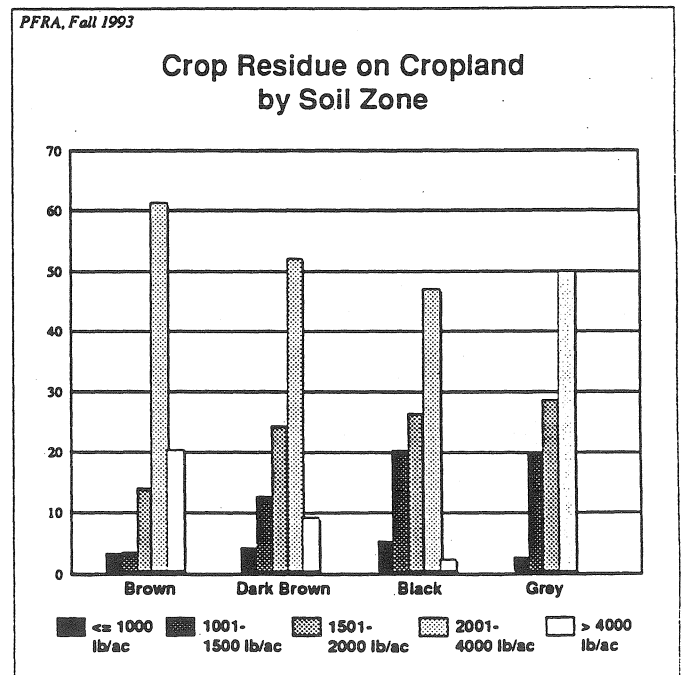
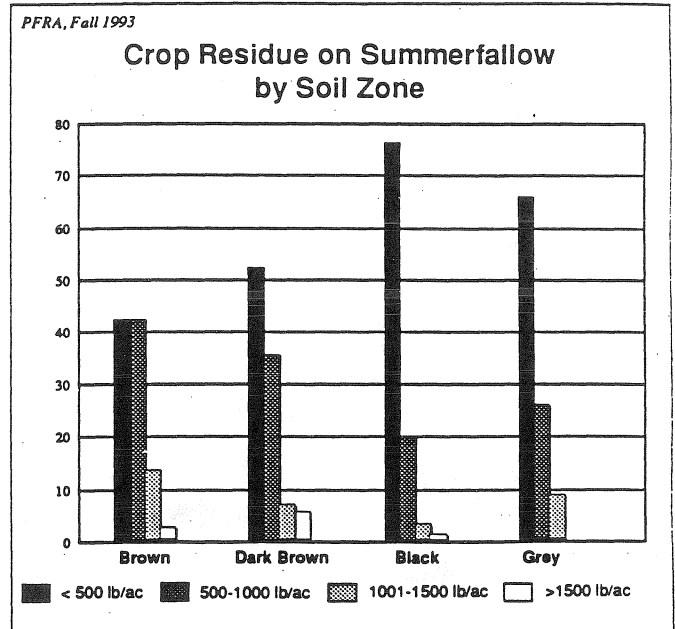
A crop residue survey was conducted by PFRA in the late fall of 1993. Of the more than 3000 fields surveyed throughout Saskatchewan, 29% were summerfallow, 55% cereals, 12% oilseeds, and 3% pulses. The survey determined that crop residue levels are again very low on Saskatchewan summerfallow. As a result, many fields will be at risk to erosion if dry, windy conditions or heavy run-off occur in Saskatchewan this spring.

Cover is Low on Summerfallow

Crop residue cover is low on summerfallow fields, with more than 89% having less than 1000 lbs/ac of crop residue. This is insufficient residue cover to protect against wind and water erosion. Tillage was used extensively in Saskatchewan in 1993, with 79% of summerfallow fields having flat residues. Only 3% of summerfallow fields have standing residues.

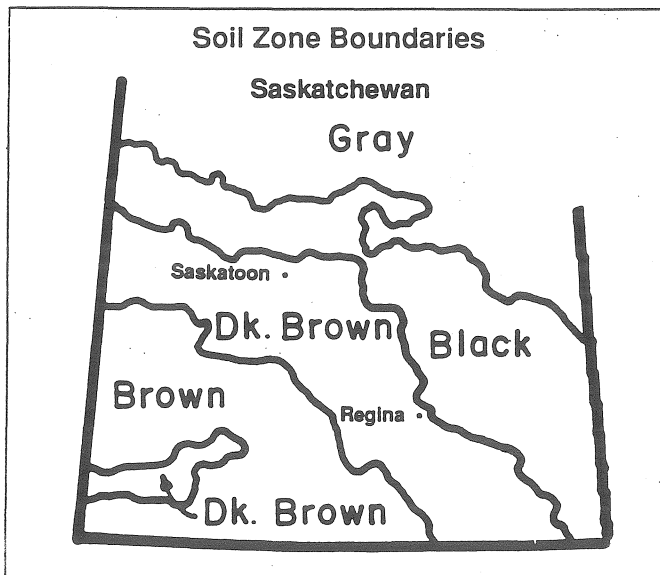
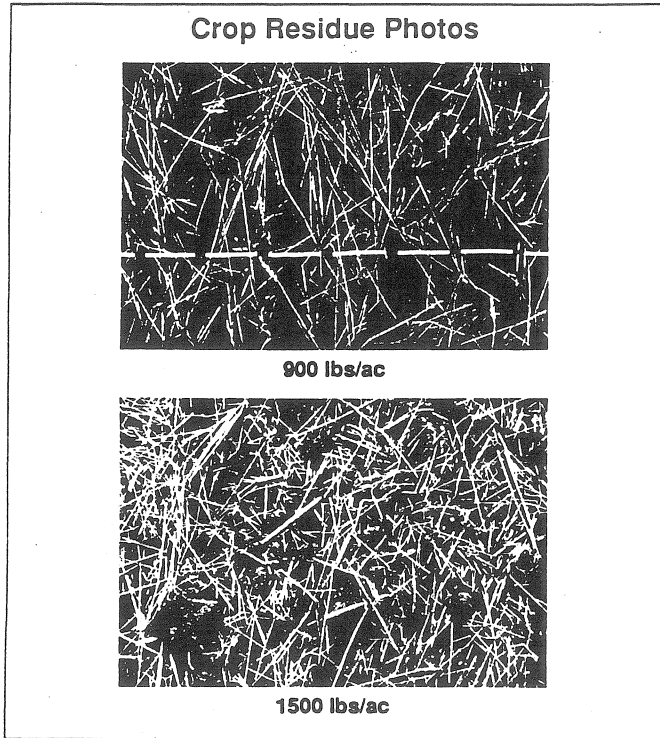
Cropland Residue is Variable

Crop residue levels are high on cropland, with 58% of fields having greater than 2000 lbs/ac cover. Fifty-five percent of cereal fields throughout the province have between 2000 and 4000 lbs/ac of residue. Cereal residue levels are particularly high in the Brown soil zone with over 4000 lbs of residue reported from 21% of the sites surveyed. Eleven percent of cereal sites in the Dark Brown soil zone have over 4000 lbs/ac of crop residue. However, almost 20% of fields cropped in 1993 have less



than 1500 lbs/ac, which means special residue conserving practices will have to be implemented on these fields next year.

Most cropped fields were still standing when the survey was taken in late October 1993, with only 21% of cropped fields tilled. Standing stubble is much more effective in controlling both wind and water erosion.



Crop Residue Protects Fields From Erosion

Crop residue cover is an inexpensive and practical tool to protect fields from wind and water erosion. Crop residue management begins at harvest. Spread straw and chaff evenly over your fields. Following harvest, determine the amount of crop residue on your fields and plan tillage practices to maintain at least 1000 lbs/ac on your fields until the next crop is well established. Do not fallow after low residue producing crops, such as legumes and oilseeds. You can conserve crop residue by substituting herbicide application in place of tillage. Winter annual broadleaf weeds can be controlled by an inexpensive early spring or late fall application of 2,4-D. You should also consider seeding systems which can seed directly into crop residue.

In addition to maintaining adequate residue levels, you may want to try seeding flax or mustard barrier strips in early summer to provide a windbreak on summerfallow fields. Permanent conservation measures such as field shelterbelts, strip cropping and grassed waterways should also be considered.

Many producers may be tempted to burn fields with heavy, poorly spread crop residue. Rather than burn, producers should consider baling straw that is poorly spread, or incorporating the residue with tillage. Some producers use techniques like mowing to shorten standing residue or chopping residue into smaller pieces.

Start planning now to control erosion next year by maintaining crop residue on the surface of your fields. Consult your nearest PFRA District Soil Conservationist or provincial extension personnel for more details on crop residue management. Publications and other sources of information, such as PFRA's CanHELP residue calculator, are available to help you with your planning.

PFRA District Soil Conservationists in Saskatchewan:

Swift Current	778-4200
Moose Jaw	691-3370
Weyburn	842-4624
Melville	728-5790
Watrous	946-3303
Rosetown	882-4272
North Battleford	445-6217
Melfort	752-4442



Direct Seeding Potential in Saskatchewan

The most effective and practical way to control soil erosion is to keep crop residue on the soil surface. Residue cover also helps conserve soil moisture by reducing evaporation and improving water infiltration.

Crop residue management is especially important when considering direct seeding and other conservation tillage systems. Direct seeding involves placing seed with minimum soil disturbance and maximum conservation of crop residue cover.

As no spring tillage is done before direct seeding, crop residues must be adequately spread at harvest time. Straw should be spread evenly over the entire cutting width of the combine or swather, and chaff should be spread over an area much wider than the combine. If residues are heavy, straw should also be chopped. Straw length, whether standing or lying flat, should be no longer than the row spacing of the seeding equipment. If necessary, harrowing immediately after harvest can help spread straw.

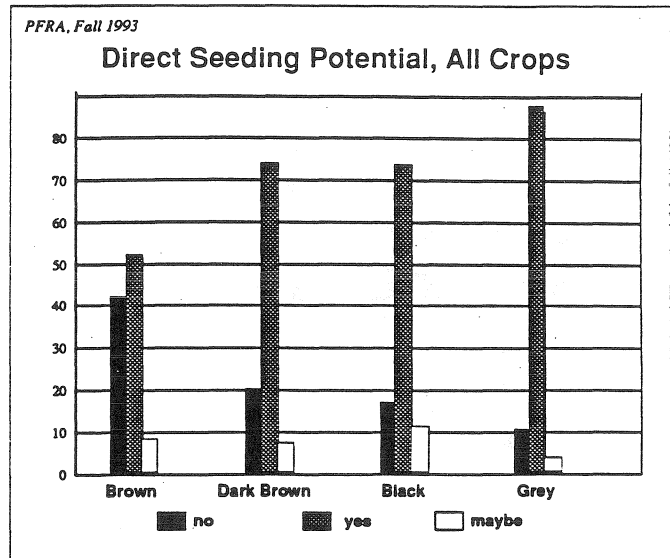
Survey Conducted in Fall 1993

PFRA conducted a field survey across Saskatchewan in the late fall of 1993. Over 3000 fields were surveyed to determine the crop type, the amount of crop residue and whether it was flat or standing, the height of standing stubble, and the spread of straw and chaff. In addition to giving a good indication of soil erosion risks, the survey assessed whether stubble fields could be direct seeded the following spring (it was assumed the seeding implement is an air seeder with narrow openers at 10" shank spacing followed by packer wheels behind each shank). Of the fields surveyed, 29% were summerfallow, 55% cereals, 12% oilseeds, and 3% pulses.

Most Fields can be Direct Seeded

The survey found that more than 70% of cropped fields in the Dark Brown and Black soil zones are suitable for direct seeding, while only half of cropped fields in the Brown soil zone are suitable. Results also showed that ninety-three percent of all summerfallow fields can be direct seeded in the Brown and Dark Brown soil zones. Generally all summerfallow can be direct seeded in the

Black and Grey soil zones. Seventy-nine percent of oilseed crop stubble can be direct seeded. Only 65% of pea and lentil fields can be direct seeded, mainly due to tangling problems caused by the viny nature of the crop.



Stubble Height Variable

Cereal stubble height averaged 8 inches in the Dark Brown and Black soil zones. It was taller in the Brown soil zone, with an average height of nine inches. Oilseed stubble was tallest, averaging 11 inches in the Dark Brown and Black soil zones.

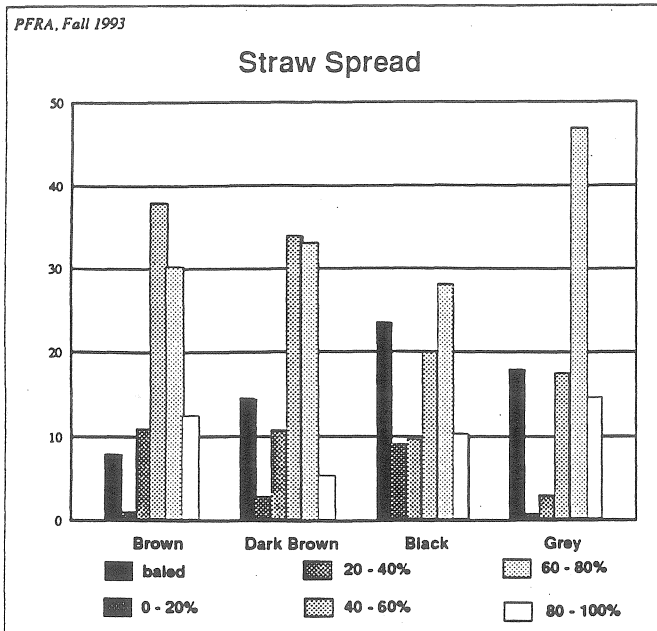
No Shortage of Straw and Chaff

Fifty-five percent of cereal fields throughout the province had between 2000 and 4000 lbs/ac of residue. Cereal residue levels are particularly high in the Brown soil zone, with more than 4000 lbs of residue being reported from over 20% of surveyed sites. Eleven percent of cereal sites in the Dark Brown soil zone had over 4000 lbs/ac of crop residue.

Straw Spread Could be Improved

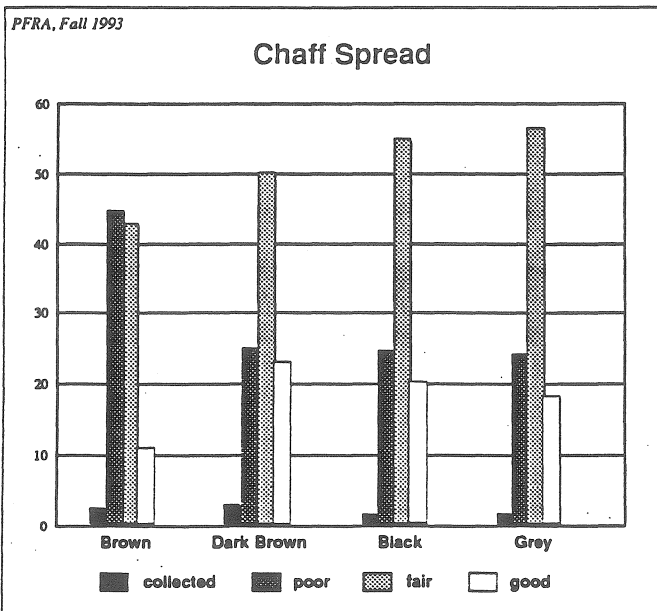
Over 40% of fields surveyed had straw spread on less than 60% of the width of cut. Straw was baled on 17% of the cropped fields surveyed, with most baling taking

place in the Black soil zone. Less than 10% of fields had straw spread over 80% of the cutting width of the harvest implement, while more than 30% of fields had straw spread between 60 and 80% of the cutting width.



Chaff Spread Poor to Fair

Chaff was collected on only 2% of fields surveyed. Overall chaff spread was rated good on 18% and fair on 52% of fields surveyed. Chaff spread was rated poor on 44% of fields in the Brown soil zone.



Can I Direct Seed or Not?

Fields which were rated as "no" for direct seeding typically had high weights of residue, taller and longer residue, and poor straw and chaff spread.

Characteristics of many of the "no" fields include:

- residue levels of greater than 4000 lbs/ac (over 30% of the fields in the Brown and Dark Brown soil zone)
- stubble higher than 10 inches
- less than 60% straw spread over the width of cut (which was seen on 66% of fields)
- "poor" chaff spread (which was seen on more than 50% of fields)

Plan Ahead for Next Year

Special management practices may be required on some fields due to heavy and unevenly spread residues. Some producers use techniques like mowing to shorten standing residue or chop residue into smaller pieces. Tillage can be used to spread residues and fill in water runs or ruts, however this also results in moisture loss and burial of crop residues.

Start planning now to spread straw and chaff well during the 1994 harvest. For more details on managing crop residues for direct seeding contact your local PFRA District Soil Conservationist or provincial extension personnel. They have publications and other sources of information, such as PFRA's CanHELP residue calculator, to help you with your planning.

PFRA District Soil Conservationists in Saskatchewan

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Moose Jaw	691-3370	Rosetown	882-4272
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