

AIR SEEDERS - HOW ARE THEY DOING?

\* Dave Durksen

Historical Background

The concept of pneumatic or air seeding originated in the Ruhr Valley of Germany about 20 years ago, when the H. Weiste & Co. began manufacturing small, pneumatic seeders, using shoe-type furrow openers. This equipment was used mainly for intensive, row-crop farming.

The German manufacturers took their concept to Australia, where the local manufacturing firms developed "broadacre seeders" with cultivator shovels as the furrow openers. This system proved ideal for large scale farming and was quickly adopted by Australian farmers. Today, it is estimated that air seeders have captured 65 to 75 percent of the seeder market in Australia.

Meanwhile, independent of and unaware of the German and Australian developments, farmer-inventors in Southern Saskatchewan began building machines for seeding, using a heavy duty cultivator as the furrow openers. It is hard to say who developed the first machine, but Preston Davey and Art Ross of Antler, Saskatchewan built their first machine in 1973, and a second one in 1974. An improved version was built in 1975 for a neighbor, who is still using the same machine today. The first serious manufacturing effort began in 1976/1977, when Preston Davey and some associates built and sold 17 Pride Seeders - 12 into North Dakota and 5 into Saskatchewan and Manitoba.

One of the first owners of the Pride Seeder was a North Dakota farmer, who promoted the machine as a Super Seeder. That year (1977) at an exhibition of new seeding equipment at Fargo, North Dakota, the Pride Seeder stole the show. Directors of Prasco were present at the exhibition and were impressed with the response of farmers to the new seeder. They purchased the rights from Pride Industries and immediately embarked on a program to manufacture and promote the machine on a large scale.

The first step involved a new name and new colors - The Prasco Super Seeder, painted white, orange and black. The initial production of about 50 machines was built in Winnipeg in the winter of 1977-1978 and sold to farmers all over Western Canada and the U.S. The first models were the Super Seeder 65, 125, 75/55 and 40/30.

In 1979, Prasco set up a dealer network, consolidated the manufacturing aspects, and added a Research and Development facility, where highly qualified engineers were given the task of making further improvements and innovations for the Super Seeder.

By 1980, Prasco Super Seeders were used by farmers all the way from north of Fort St. John, B.C., where they seeded wheat, barley and rapeseed, to Abilene, Texas, where the Super Seeder was used to seed sorghum and cotton.

cont'd....

## Historical Background - cont'd

Air seeders had attracted a great deal of attention from farmers and the farm press. At least four other farm equipment manufacturers in southern Saskatchewan began building air seeders, and another two or three firms became distributors for Australian machines. At last count, eighteen different air seeders were vying for the Canadian seeder market. About four or five manufacturers/distributors are located in the U.S.

### The Advantages of Air Seeders

The air seeder is an important part of the evolution in farming methods, involving almost every type of farming, from grains to oilseeds, to forage crops. The machine evolved because a practicing farmer saw the need for greater efficiency in farming - savings in labor, fuel and soil. The Super Seeder and other air seeders, offer the following minimum tillage advantages for the modern, progressive farmer:

- 1) SAVINGS IN ENERGY COSTS - achieved by less trips over the field, combining cultivating operations with seeding and or banding fertilizers, etc. Some farmers claim to have cut their fuel bill in half. Some Super Seeder owners are adding other operations with the seeding trip, such as applying herbicides, harrowing and packing.
- 2) SAVINGS IN LABOR COSTS - less labor is required to fill the grain tank and fertilizer compartment; air seeders can be safely used at speeds of 5 to 8 miles per hour. Most operators find they do not need to look for hired help now that they have an air seeder. The ease of transport - "ability" - is one factor that contributes to labor savings.
- 3) SAVE THE SOIL - The dry period in 1980, covering a large part of the Canadian prairies and extending into the central part of the northern United States, served to emphasize the need for farmers to adopt tillage practices which would reduce or eliminate damage from wind and water erosion.
- 4) SAVE MOISTURE - conserving soil moisture in the spring can mean increased yields and/or as in 1980, the difference between an average crop or no crop at all. The air seeder allows a farmer to seed as he tills the soil, all in one operation.
- 5) IMPROVE SOIL QUALITY - soils specialists have published articles warning of the loss of organic matter with each additional tillage operation. Owners of air seeders are urged to adopt minimum tillage practices as one of the advantages of an air seeder.
- 6) FERTILIZING BANDING - by combining a tillage operation with deep banding of fertilizer, reduces the cost of application plus the advantages of placing fertilizer(s) where plants will utilize nutrients more effectively.

cont'd.....

The Advantages of Air Seeders - cont'd

7) INCREASED PROFITABILITY - farmers in North America are forced to search for new ways to reduce the ever-increasing costs of food production. The air seeder owner has a tool which does this because:

- of reduced costs of fuel, lubricants and repairs
- of reduced labor costs and increased productivity for every man/hour of labor input
- the air seeder is ideal for banding fertilizers
- the machine can be adapted to applying fertilizers and/or herbicides along with a tillage operation
- it is a machine designed for minimum tillage farming and reducing summerfallow
- an air seeder owner can farm with a lower machinery inventory.

Problems, Concerns and Remedies

Based on response from Prasco Super Seeder owners, some of the practical problems and concerns which have emerged from these responses are as follows:

- 1) A NEW MACHINE - The air seeder, as a machine that has had only three or four years of practical, on-the-farm testing, is still in an evolutionary process. The most remarkable feature of the machines built in 1981 is the close resemblance to the first machine hand-built by Preston Davey and Art Ross in Antler, Saskatchewan. But there obviously will be changes and improvements in air seeder design in the machines built in 1990, just as there have been significant changes in every other farm machine. Farmers buying an air seeder are an integral part of the evolutionary program that will mean better machines 5 and 10 years from now. The potential problem with some air seeder owners is that they fail to accept the machines as the best that are available at this time and not the final ultimate version. The remedy is patience and understanding.
- 2) MINIMUM TILLAGE - The concept of reduced or minimum tillage is now becoming widely accepted by farmers in North America. There is still, however, a problem of defining "minimum tillage" and applying the concept to each particular farming operation. Practical experience suggests that for most farmers it involves a gradual phasing-in of reduced tillage operations, to the point where they can grow an excellent crop with one or two tillage operations, using the cultivator or chisel plow and air seeder for banding fertilizers and seeding the crops. The problem is one of education or practical demonstration of the benefits of minimum tillage. The remedy will involve the industry, helping the farmer to see the benefits and necessity of changing his farming practice.

cont'd.....

Problems, Concerns and Remedies - cont'd

- 3) DEPTH CONTROL - The air seeder uses a field cultivator or chisel plow as the seed furrow opener. Under normal cultivation, farmers are not overly concerned about uniform depth of cultivation, but when these implements are used for seeding, the matter of depth control and uniformity of depth of seed placement is of considerable importance. There is a substantial difference in the way air seeders are mounted and/or attached to the cultivator or chisel plow. Some makes can be adjusted more effectively than others. The depth variation on very uneven, rolling land depends on the make of air seeder and the width of the cultivator. Hitching arrangements can influence depth control significantly in certain kinds of terrain. This is where the Prasco three-point "rolling" hitch has demonstrated advantages over other hitching arrangements. Depth control, under normal or favorable moisture conditions is not as much a real problem as a perceived problem, especially when the emerging crop (which may look pretty ragged and uneven!) is compared to a crop seeded with a press drill. The acid test of final yield results usually means a satisfied air seeder owner. One remedy is becoming available to air seeder owners, namely an electronic depth control device. The other remedy is experience, patience and inventiveness on the part of the owner.
- 4) SEEDING ACCURACY - Air seeders are being tested by PAMI for accuracy of seed and/or fertilizer distribution. PAMI has stated that a C.V. of less than 15 per cent is considered as an acceptable variation. Some early claims of extreme accuracy have led to misunderstanding from some owners; so that most air seeder manufacturers have now toned down or omitted claims for accuracy of product distribution. The problem can be one of misunderstanding as to what is acceptable as to variability of product distribution, and also how the C.V. is determined.
- 5) MONITORING - Some owners are concerned that they are unable to see from the tractor cab, whether each outlet is seeding or not. While the failures or problems are few in number, the concern is there, nevertheless. The remedy is providing monitoring devices which will warn the operator of any problems. This equipment is available as an option by most firms.
- 6) PACKING/PACKERS - To pack or not to pack, that is the problem! It is obvious that seed germination will be improved if the seeded area is packed, preventing loss of critical moisture which is required to start seed germination. Some users find harrowing quite sufficient. For some soil types, packers appear to be helpful and air seeder owners insist on using packers. Most air seeder and/or cultivator manufacturers now have packer units available for those farmers who want them.
- 7) CAPACITY - Most farmers like to have equipment with greater capacity and speed than is required under normal conditions, in order to be ready for adverse weather conditions when timing becomes critical. Air seeder manufacturers have already provided greater capacity in their seed tanks than is available in most conventional seeding equipment. There is a practical limit to how large these tanks can be made. Options are available for ease and speed in filling the tanks with seed and/or fertilizer.

cont'd.....

Problems, Concerns and Remedies - cont'd

7) CAPACITY - cont'd

Another aspect of "capacity" is the width of equipment and speed of operating the air seeding unit. Here too, the practical limits must be considered. The remedy is obvious - the expectations must be reduced to the practical limits of equipment.

Conclusion

Farmers in North America are looking for information and equipment which will help them to farm more profitably as they are being challenged to meet the growing food needs of a hungry world.

The economic difficulties encountered by many farmers in 1980, in the drought-stricken parts of the Prairies, along with large areas in the U.S. and duplicated every year in one part of the world or another, serves to underscore the fact that the air seeder is "the right machine for the right time".

A farmer came up "with a better idea" - the Super Seeder!

\* This paper presented at the Soils and Crops Workshop, University of Saskatoon, Saskatchewan - February 16th and 17th, 1981.