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Getting the most from on-farm grower canola trials

On-farm crop trials give growers an opportunity to try a new management practice or product and find response areas, both negative and positive, within a particular field. The trials are visual, conducted under the "show me principle" and the results are often predictable. Growers use the information they provide to decide whether they want to adopt the new practice or product on the whole field or their entire farm.

Producers establish and manage on-farm tests using field scale equipment. They may look to an agronomist or extension agent to ensure proper planning principles and methods are used.

Planning is important

The success of an on-farm trial depends on planning and evaluation. A number of questions need to be asked, including:

1. What are the objectives or goals of the project?
2. How many trial locations will there be?
3. Where will the trials be located?
    a) What agro-climatic zones?
    b) What soil type or zones?
4. What treatments should be included? Methodology?
5. Who will plant, record information, harvest?
6. What outside expertise is required to conduct the project?

On-farm demonstrations or strip trials should be kept as simple as possible. Two treatments are ideal - one that illustrates a new practice or product and the other that demonstrates a normal practice. If more than two treatments are compared, it becomes complicated and difficult to properly manage.

There is no estimate of error with strip trials because there is no replication. Therefore, there's no statistically valid method to judging differences between treatments. If the strip trial is conducted at a number of sites, however, a trend may be able to be established for that particular year.

Plots must be uniform

To achieve the goals of field experimentation it is crucial to choose a field that is uniform in slope, drainage, and fertility.The soil type must be representative of the area. Uniform plots will minimize the natural variation and allow any measured differences to be attributed directly to the treatments.

Plots should be as long as possible

The length of a plot is crucial. Studies have shown that field variation (experimental error) is reduced dramatically as plot length is increased. The longer the on-farm plot, the more reliable the results. To ensure the best results, plot treatments should be as long as practical within that particular field – at least 250 to 750 feet or more.

Keep accurate harvest records

It is important to ensure that all harvested areas are equal. For example in the picture (Figure 1) below, the treatment has standing canola on both sides of the swath ensuring that the full width of the swather was used over the length of the test area. If the length of some plots must be shortened due to odd field shape or problems such as flooded out areas, then area harvested must be accurately recorded and all data reported on a per unit area basis (e.g. bushels/acre).

For accurate results, use this calculation protocol for production comparisons. Imperial measurements are used in the following example, the same methodology can be used for metric measurements.

Figure 1. Appropriate swathing technique for on-farm testing

1. Mark the swath/plot area that will be used for comparison purposes, using a pin flag or stake.
2. Measure the strip length and record number in feet, i.e. 855 ft.
3. Combine the test area. Record the number of pounds harvested and convert pounds. to bushel weight. i.e. 1200 lbs. ÷ 50 lb/bu of canola = 24 bushels of canola. To measure the volume harvested, use a weigh wagon or the weigh scale system within the combine's grain hopper.
4. Measure the total width of the swath taken for harvesting. Measure the cutting bar width on the swather or straight cut header on the combine. i.e. 26 ft 4inches.Convert 4 inches to decimal point in feet, 4 inches ÷ 12 inches/foot = 0.333 inches.Therefore, total width = 26.33 feet of area cut for harvest.
5. Next, calculate square area harvested. Swath width 26.33 ft X length of strip 855 ft. ÷ 43,560 square feet per acre = 0.516 of an acre.
6. Final yield calculation; 24 bus ÷ 0.516 of an acre = 46.5 bushels/ acre

So what can you learn?
On-farm demonstrations or strip trials do not provide measurable production results for critical comparison but they can provide usual economic information.

For instance, to evaluate return on investment, growers need to know the average treatment response, expected crop price, and the cost of the treatment. Then, they can calculate profitability margins.The reliability of this economic comparison will be still be questionable if it's based on a single comparison or strip trial, but the accuracy of the average trend will improve as the number of reps or trials conducted increases.

Use a Contribution Margin Worksheet
To compare the effects of two on-farm treatments on returns per acre, plug variable costs into this worksheet. Only costs which vary directly with the volume of production or activity (e.g. seed, fertilizer, fuel and repairs), are included in this worksheet. There are no values included for capital and fixed costs. When comparing treatments, keep in mind that in addition to yield and costs, canola prices may also change if some of the treatments have an impact on grade.

Contribution Margin Worksheet

CALCULATION OF VALUE OF PRODUCTION

Yield (bu/ac)	X	Price ($/bu)	=	Value of Production

CALCULATION OF VARIABLE COSTS ($/ac)

Seed	
Fertilizer	
Herbicides/Fungicides	
Insecticides	
Machinery	
Insurance	
Marketing	
Interest/opportunity	
Total Variable Costs	

CALCULATION OF CONTRIBUTION MARGIN

Value of Production ($/ac)	–	Variable Costs ($/ac)	=	Contribution Margin ($/ac)

Contribution Margin ($/ac)	/	Yield (bu/ac)	=	Contribution Margin ($/bu)

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