DIRECT COMBINING OF CANOLA IN WESTERN CANADA

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INTRODUCTION

Over the last ten years, many producers in western Canada have begun to direct combine (straight cut or straight combine) their crops versus the traditional swath and combine harvest procedures. The advantages in straight combining include eliminating the swathing operation and associated economic costs and operational time. While confident in using the direct combining procedures in cereal crops, concerns were raised regarding direct combining of spring canola due mainly to fears of pod shatter and drop due to the effects of wind on mature, standing crops. In the past, straight combining of canola was recommended only in cases where the crop was very short or there was a danger of wind scattering the swaths (Canola Growers Manual). Further questions arose regarding the relative ability of different varieties to withstand shattering and pod drop prior to harvest. This paper will discuss the results from several years of field scale trials conducted under the Canola Production Centre program by the Canola Council of Canada. The effects of straight combining versus the traditional swath and combine procedure on crop yield, and oil content will be covered with both Brassica napus and Brassica rapa species.

METHOD

Several varieties of both B. rapa and B. napus types were compared under both straight combining and the traditional swath and combine method at many locations within western Canada over the period from 1990 - 1994. These trials were conducted at the Canola Production Centres, which are field scale demonstration and research sites across western Canada. These trials were conducted in a randomized complete block design with four replicates. Typical size of each individual plot was 9 m x 122 m. The harvesting was conducted using regular farm equipment and the yield from each plot was measured using a weigh wagon. Grain samples from each plot were obtained at the time of harvest. These samples were subsequently analyzed using an NMR (nuclear magnetic resonance) analyzer.

RESULTS

Compiled results from the numerous site years of data are presented in Figures 1 and 2.

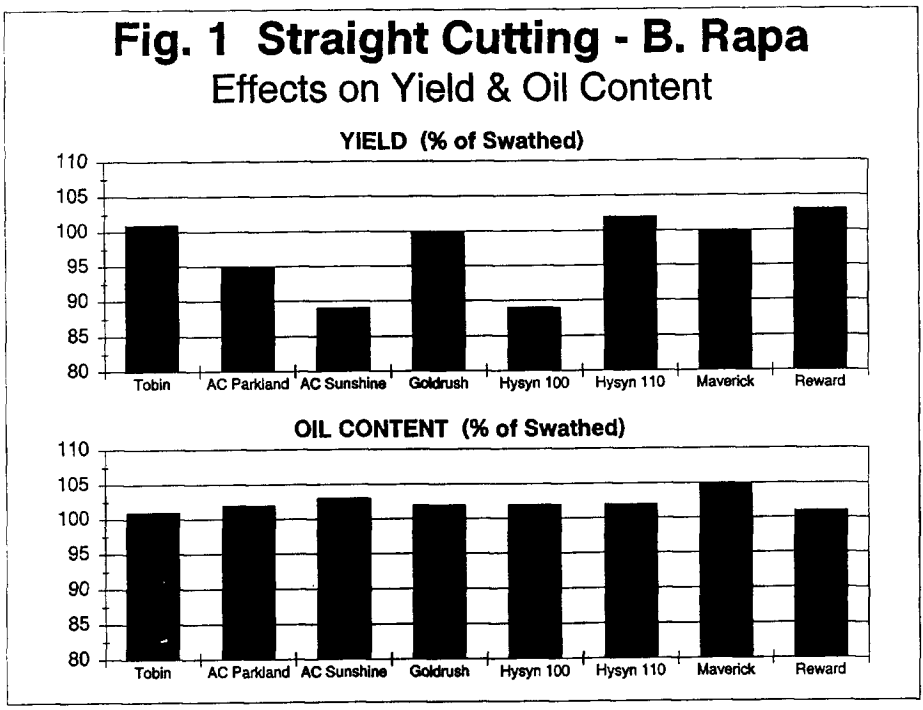
Fig. 1 Straight Cutting - B. Rapa
Effects on Yield & Oil Content
YIELD (% of Swathed)
110
105
100
95
90
85
80
Tobin
AC Parkland
AC Sunshine
Goldrush
Hysyn 100
Hysyn 110
Maverick
Reward
OIL CONTENT (% of Swathed)
110
105
100
95
90
85
80
Tobin
AC Parkland
AC Sunshine
Goldrush
Hysyn 100
Hysyn 110
Maverick
Reward

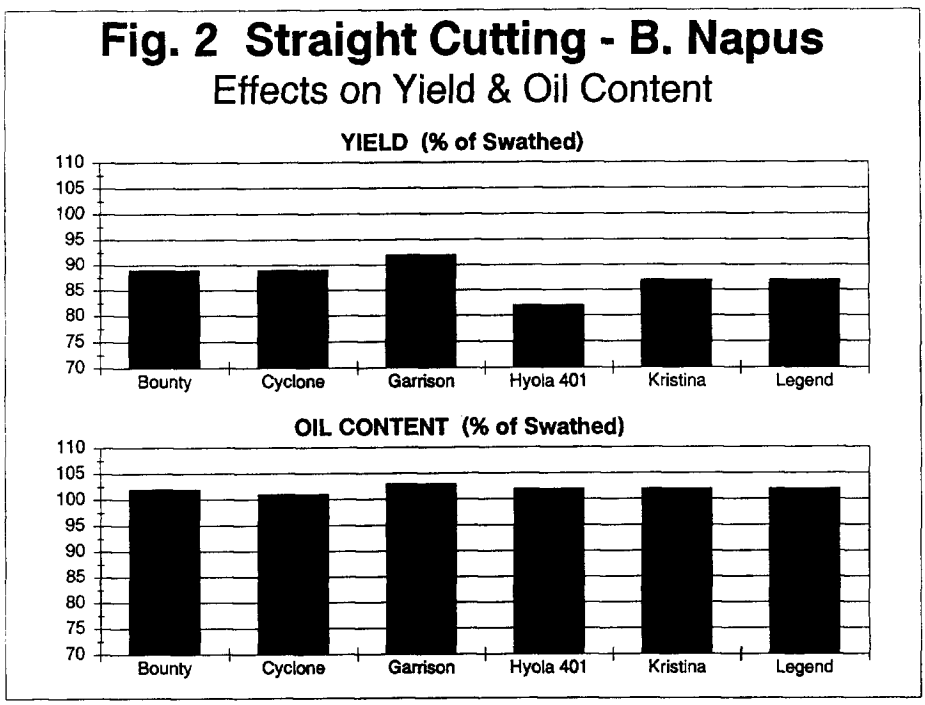
Fig. 2 Straight Cutting - B. Napus
Effects on Yield & Oil Content
YIELD (% of Swathed)
110
105
100
95
90
85
80
75
70
Bounty
Cyclone
Garrison
Hyola 401
Kristina
Legend
OIL CONTENT (% of Swathed)
110
105
100
95
90
85
80
75
70
Bounty
Cyclone
Garrison
Hyola 401
Kristina
Legend

DISCUSSION

The majority of the B. rapa varieties yielded as well as or better under straight combining than under the traditional swath and combine method. The only varieties that yielded less under straight combining were AC Sunshine, Hysyn 100 and AC Parkland. There were differences from site to site and somewhat from year to year, but generally speaking, straight combining usually performed better under heavier crop conditions where the crop canopy was leaning or lodged somewhat. Although this method also often worked under conditions of little or no crop lodging, the risks from winds causing pod shatter or drop were also greater and sometimes caused substantial crop losses in individual site-years. Another effect that was apparent was that of the disease, alternaria black spot. This disease causes yield losses from pod shatter and these losses appear to be accentuated when the crop is left standing for straight combining. Oil contents were equal to or slightly higher under straight combining as compared to swathing with all the B. rapa varieties.

Within the B. napus types, most of these varieties performed poorly under straight combining as compared to swathing with regards to yield. This is due to the fact that most of the B. napus types are more prone to pod shatter than the B. rapa types. There were a few site years where straight combining performed equal to or slightly better than swathing, but these were generally instances where crop growth was excellent, and little risk from wind movement of the crop canopy was present due to crop lodging. There appears to be a slight advantage for varieties such as Garrison and Cyclone, which generally have a much stiffer stalk than varieties like Legend and Hyola 401. However, even with these varieties, yield losses are usually substantial enough to negate any of the economic benefits of straight combining. With regards to crop quality, oil contents are also equal to or slightly better under straight combining as compared to swathing. Again, however, these quality advantages do not balance off the negative impact on yield under straight combining.

CONCLUSIONS

In general, straight combining of most B. rapa types is a viable harvesting method as long as the risk from crop canopy movement from wind is not great and if disease levels are relatively low. Crop yield and quality are usually as good as or somewhat higher under this method and the additional economic and operational advantages of straight combining over swathing make this method an attractive alternative. However, most of the B. napus types usually suffer substantial yield losses under straight combining and therefore, this method can only be suggested as an alternative under conditions where crop growth is relatively heavy, with subsequent lodging, and the risk of crop canopy movement from winds is low.

REFERENCE

Thomas, P. (1984). Editor. *Canola Growers Manual.* p. 1106. Canola Council of Canada. Winnipeg, Manitoba