ADAPTED CANOLA GENOTYPES FOR DIFFERENT US MARKET.

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Introduction

Since CANOLA got G.R.A.S. status in 1985, many *Brassica Napus* lines, primarely from western Europe, have been tested in at least 25 different states.

In this paper, we propose basic agronomic requirements genotypes should meet to be grown succesfully in each identified area.

MATERIAL and METHODS

Weather data from the weather atlas (ESSA, 1968), university Canola yield tests results, communications with universties personnels and market considerations in every area have been combined in order to characterize the different segments.

RESULTS and DISCUSSION

Figure 1 lays out the 9 area where we identified canola could take a significant market.
Boundaries have been set for a better comprehension but are in fact largely affected by local conditions.

SPRING CROP

About a third of the Canola acreage is located along the northern US border, in the states of Montana, North Dakota, Minesota, Michigan.

* **NORTHWEST** is characterized by dry and hot summer so flowering and seed setting must occur before that period. Short cycle spring lines have consistently better results than long cycle types.

Table 1 : 1990 Yield average of 10 locations in MT & ND.

Westar	1066 Lbs/acre	
MLCP 008	1020 "	] Short cycle (100 days)
Pactol	1085 "	
Global	979 "	
SR 126	921 "	] Long cycle (110 days)
MLCP 035	929 "	

* **NORTHEAST** has milder seasons due to the lake effect and long cycle lines perform very well.

Table 2 : 1990 Yield average of 8 locations in MN, WI & MI.

Westar	1785 Lbs/acre	
MLCP 008	1820 "	] Short cycle
Pactol	2165 "	
Global	2430 "	
SR 126	2043 "	] Long cycle
MLCP 035	2236 "	

WINTER CROP

* **COASTAL PLAINS** winters are very mild and hot period come early so vernalization and seed setting are a problem for winter canola (biannual) wereas long cycle spring (annual) lines perform well (Tab.3). Short cycle lines are to early and may be stroken by late frost in full bloom.

Table 3 : 1990 canola performance in COASTAL PLAINS.

	Blackville C.plain, SC			Midville C.Plain GA			Tifton C.Plain, GA			Griffin Up. Plain GA.		
	Y	F	M	Y	F	M	Y	F	M	Y	F	M
Winter												
CC 349	2734	3/23	5/15	1871	3/20	5/21	1474	3/27	5/26	3541	3/26	6/08
DCH 4	2400	3/21	5/14	2159	3/13	5/20	2165	3/21	5/26	3446	3/23	6/04
Liborius	1327	3/28	5/20	1298	3/21	5/27	1012	4/05	5/27	2770	3/30	6/10
Spring												
CC 310	-	-	-	2374	2/20	5/08	3107	2/24	5/02	-	-	-
Pactol	-	-	-	2216	2/15	5/05	2709	2/14	4/30	-	-	-
Global	2927	-	4/26	2575	2/21	5/08	2917	2/24	5/04	2276	3/07	5/25
Westar	2588	-	4/20	2148	2/07	5/05	2514	2/08	4/29	1553	2/14	5/18

Y: yield Lbs/acre; B: 50% bloom (month/day); M: maturity (month/day)

As shown here, spring lines are usually harvested about 20 days earlier than winter lines, a major advantage for double crop.

* **The SOUTH** is not a well developed market, yet. Results from Texas and Georgia (see below) show a very early variety like DCH 4 perform the best by combining winter hardiness and flowers before hot periods.

Table 4 : 1990 Canola performances in the "SOUTH"

	Calhoun, GA		Munday, TX	
	Yield	50 % Bloom	Yield	50 % Bloom
DCH 4	3916 Lbs/a	03/19	3318 Lbs/a	03/30
CC 349	3749 "	03/24	2316 "	03/31
Liborius	3382 "	03/28	2074 "	04/07
Lirabon	3020 "	03/26	1906 "	04/06

* **PLAINS** is potentially a large market considering wheat acreage Canola could be rotated with. However, dry falls that could dramatically delay emergence and make crop establishment unconsistent along with above average winter kill did not give accurate yield results these past years. Developpement of the canola crop in this area is still questionnable.

* **The CENTRAL** area is characterized by winter temperature comparable to Europe but with large amplitude within weeks and warm and moist spring and early summer favorable to disease development. Sclerotinia (*Sclerotinia Sclerotiorum*) and Black leg (*Phoma Lingam*) are the two major threats reported.

No significant yield differences have been measured between the best european lines under normal conditions.(Table 5)

In this area most of the canola is double cropped. Earliness is a major farmer's requirement.

Table 5 : '88/89-'89/90 average Yield of major commercial lines.

Variety	CENTRAL	GREAT LAKES
Liborius	2300 Lbs/acre	2290 Lbs/acre
CC 349	2560 "	2169 "
Ceres	2511 "	2326 "
Cobra	2391 "	2200 "
Winfield	2328 "	2299 "
Diadem	2266 "	2189 "

* **GREAT LAKES** is, so far, the area with the largest winter canola acreage. Snow cover provide the crop an adequate protection against cold winter, but the best winter hardiness is still required.

Disease pressure is lower, and milder summer make canola a competitive full season crop. Like in Central area, "continental" european lines are not significantly different (Table 5). "Atlantic" type, however, do not have enough winter hardiness to be widely grown in this area, so far.

* **EAST COAST** : not enough data are available yet to have a reliable opinion on the most recent canola area. Mild seasons and ocean influence appear to be favorable to the crop, but disease may be a serious potential problem.

* **PACIFIC NORTH WEST (P.N.W.)** is a mosaic of many different environements where winter hardiness and drought tolerance are the two common concerns.

CONCLUSION

The segmentation we propose here is the first step toward a better understanding of this new crop for the US farmers.

It sould contribute to fieldtest network improvement and better breeding program orientation.

In the present situation european genetic performs quite well under the more contrasted US environement.

Specific breeding is however necessary to enhance winter hardiness and earliness along with yield potential, disease resistance and other traits european breeding program do work on.

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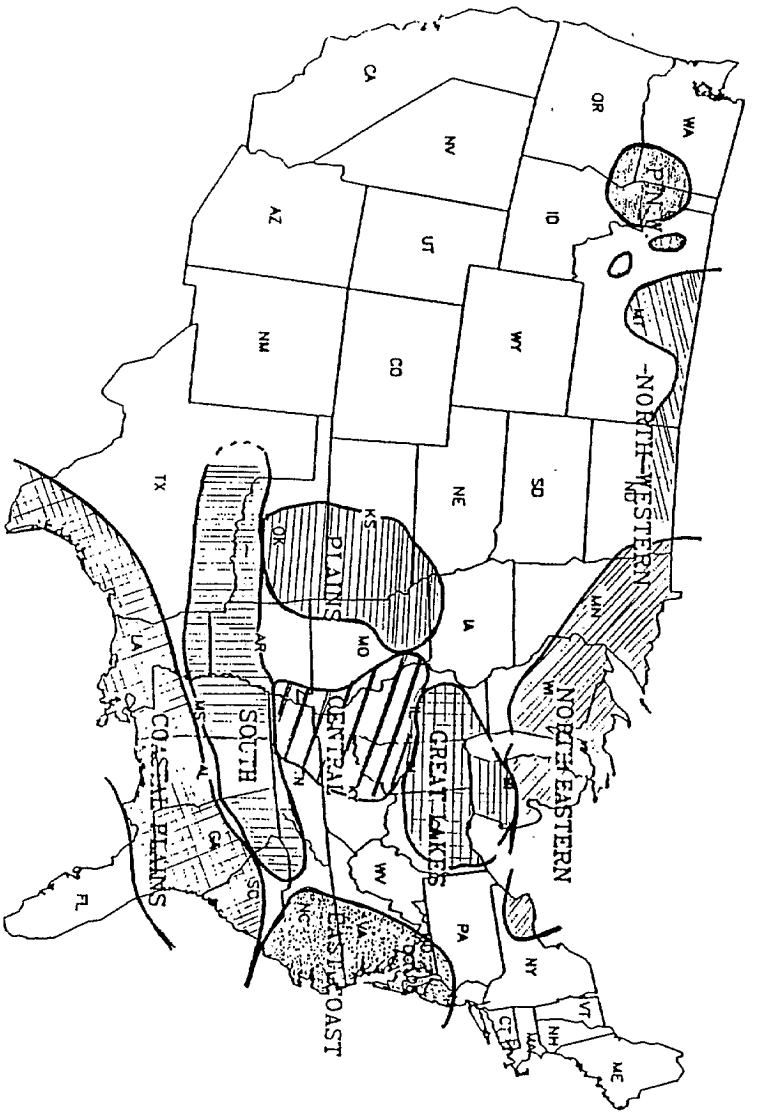

Fig. 1 : CANOLA MARKET SEGMENTATION in the U.S.A.