

Monola™ Oil: High stability canola oil in Australia

Nuseed Cultivars for HOLL Markets

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Canola oil

- **Canola = oilseed success story**
 - ‘healthiest’ salad/domestic cooking oil
- **Good dietary oil, Good balance of FAs**
- **Market leader for omega-3 FA's (12% C18:3)**
- **Market leader Retail Sector (spreads, bottles)**

Why Canola oils are Not Good Frying Oils?

- High level C18:3 (12%) causes instability of the oil
 1. Breakdown products unpleasant
 - breakdown leads to “fishy” odours
 - & reduced sensory properties
 2. Reduction of shelf life of oil and end products (fries, potato chips, snacks)
- At 1.6m MT of grain @ 40% oil represents **70%** of domestic production of vegetable oils
- Usage of 120KT oil represents some **25%** total domestic usage (~450kt oils & fats)

How to Get Stable Frying Oils

■ Change fatty acid composition in oils

1. Hydrogenation

Problems

- Saturated fat, Trans Fatty acids,
- Hydrogenation Flavour (waxy, fruity, paraffin)

2. Plant-breeding

- Dietary benefits of products (reduced saturates)
- High Oxidative Stability

Plant Breeding Solution to get stable frying canola oils

- Increase the level of oleic acid (C18:1)
- Lower level of linolenic acid (C18:3)

Expand opportunities for usage for canola oils

- An import replacement for palm and animal fats ~200Kt oil
 1. Oils that are solid when cold, after use=removal problem
 2. Don't fit the image of **“Healthy Oils & Fats”**
- Stable oils=Positive dietary benefits & domestic economy

Recommendations for Fatty Acid Compositions for Stable Frying Oils

According to USDA studies by group headed by Dr Kathleen Warner

- 5-7% saturates (C16:0 + C18:0)
- 63-73 % oleic C18:1
- 15-22% linoleic C18:2
(enhances sensory properties)
- $\leq 3\%$ (3.5%, 4%) linolenic C18:3 *(essential for frying stability)*
- A (\leq) 6:1 ratio of polyunsaturates (Linoleic: Linolenic)
optimal for dietary intakes of products (reduced saturates)
- No real benefit of higher oleic levels

Monola™ Oil



- **Specialty Canola developed by Nuseed**
 - FA composition of canola modified by normal plant breeding
- **Greatly enhanced stability vs. Canola Oil**
- **Exciting extension of Canola for Aust.**
- **Sensory properties (taste, flavour, odour)**
 - good deep fried flavour in Food
 - No off flavours
- **No need for hydrogenation**

Market and Industry Perspectives for Specialty Canola

Oil Type	Saturated Fatty Acids	Monounsaturated	Polyunsaturated	
	Palmitic + Stearic C16:0 + C18:0	Oleic C18:1	Linoleic C18:2	Linolenic C18:3
Canola Oil	7-8%	60% (57-62%)	20%	12%
Monola™ Oil	6-7%	70% (67-71%)	20% (17-22%)	2.9% (2.2-3.5%)
Olive Oil	16-24%	70-77%	6-8%	
Palm Olein	50%	45%	4%	

Development of Monola™ cultivars



- **> 14 years to develop cultivars**
 - Grain yields (95-100%)
 - Blackleg disease resistance & agronomic traits similar to canola
- **Extensive laboratory analyses:**
 - GC & NIR
- **Fatty acid profiles suitable for diverse markets**
- **Herbicide resistance a key priority**
 - Eg. Triazine-Tolerant

Wherever Canola is Grown, so can Monola

Lines are evaluated for disease resistance



Source: Steve Marcroft (MGP, 2004)

Lines are evaluated for grain yield and agronomic traits



Extensive Laboratory analyses: oil, protein, glucosinolates & fatty acids



Current Monola™ Cultivars: Monola™ 77TT

- **A Triazine herbicide-tolerant HOLL cultivar**
 - First across-the board cultivar
 - Suitable for production in the major canola regions



Maturity:	Medium
Blackleg Res.:	MR
Oil%:	Bravo TT+2%
FA profile:	Excellent
	C18:1=69-71%
	C18:3=2.7-3.3%
Yield:	~100% Bravo TT (2008 NVT)

2008 National Variety Testing (NVT) Trials

Nuseed entries

Monola 76TT & 77TT

VIC, NSW, SA =23 SITES

WA =10 SITES

Western Region	
Cultivar	% Site Mean
Monola 76TT	107 (38.6)
CB Argyle	105 (38.3)
Tornado TT	105 (36.5)

Southern Region	
Cultivar	% Site Mean
Monola 77TT	108 (38.9)
Atr-Marlin	99 (37.4)
Tornado TT	99 (36.5)

() % Oil Content

Specialty breeding programs: Needs?

C18:3 content = f (Cultivar, Temperature, Rainfall)

■ Temperature

- Post-flowering high temperatures hasten crop maturity
- At high temperatures-less PUFAs
- C18:3 decreases during exposure to high temp. during seed-filling.

Target Population of Environments:

Established “more reliable” production regions

- particularly the better rainfall regions,
- less prone to severe frosts during seed-fill
- regions produce the higher oil content &
- most consistent fatty acid profiles

**Monola cultivars for
reliability of yield & stability of FA profiles**

Summary-Specialty Canola

- **Monola™ TT cultivars: Excellent performance in NVT trials**
 - Grower awareness and acceptance
- **SPEC canola = Major extension of Canola Opportunities**
- **Main focus=Frying applications**
 - potential market > 130kt oil

