Camelina: A Winter or Double Crop with New Market Opportunities

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Camelina sativa

- Brassica family spp. believed to originate in the Mediterranean/Europe/Asia. (long history)
- ~400,000 seeds per pound, seeding rate of 3 lbs/a, early spring plant, maturity ~80 days
- Oil content of 35-40 percent, high (40%) Omega-3 content and antioxidants (stability)
- Low input with 2000+ lbs/a yield potential (actual yields to date 1000 to 1250 lbs/a)
NOT in USA!
Camelina Oil (Gold of Pleasure)
(INCI = Camelina Sativa Seed Oil)

Camelina Oil (commonly known as Gold of Pleasure) is a cold pressed oil from the seeds of the cruciferous annual plant Camelina Sativa. It is also called false flax since it is often found growing wild amongst flax. Camelina Oil is a very rich source of Polyunsaturated Fatty Acids (PUFAs) which makes it an excellent choice for nutraceutical use. Due to its high EFA [essential fatty acid] and linoleic acid content, Camelina Oil has very good effects on the skin, acting as an anti-age and emollient agent to improve skin elasticity and suppleness. May be used in cosmetics, toiletries, soaps, OTC pharmaceuticals, sun care and nutraceuticals.

Suggested Use Levels: Lotions & Creams 1-5% | Balms: 2-7% | Bar Soaps: 2-7% | Nutraceuticals: up to 100%

**SPECIFICATION**

Iodine Value (CALC)
Free Fatty Acid Content (% as Oleic)
Color (Lovibond E° Cell)
Peroxide Value

**TYPICAL RESULT**

140 - 160
2.0 max
</-15 Y, </- 5 A
10.0 max

**FATTY ACID PROFILE (Typical Results)**

<table>
<thead>
<tr>
<th>Fatty Acid</th>
<th>C</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Palmitic</td>
<td>C16:0</td>
<td>4.0 - 6.0</td>
</tr>
<tr>
<td>Palmitoleic</td>
<td>C16:1</td>
<td>Trace - 1.0</td>
</tr>
<tr>
<td>Stearic</td>
<td>C18:0</td>
<td>1.0 - 3.0</td>
</tr>
<tr>
<td>Oleic Acid</td>
<td>C18:1</td>
<td>10 - 14</td>
</tr>
<tr>
<td>Linoleic</td>
<td>C18:2</td>
<td>14 - 17</td>
</tr>
<tr>
<td>Linolenic</td>
<td>C18:3</td>
<td>35 - 50</td>
</tr>
<tr>
<td>Arachidic</td>
<td>C20:0</td>
<td>0.5 - 2.0</td>
</tr>
<tr>
<td>Gadoleic</td>
<td>C20:1</td>
<td>12 - 17</td>
</tr>
</tbody>
</table>

The water content of Camelina Oil is below the required level to support the growth of microorganisms. Therefore, microbiological tests are not deemed applicable.

Store in air-tight container in cool, dark location to avoid air and light exposure.

The above specifications are offered in good faith, and are accurate to the best of our knowledge; however, no guarantee or warranties are offered or implied. It is recommended that your laboratories perform their own analysis to ensure that the product specifications and results meet your specific requirements, and those of your local and national governmental standards.

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08/06
Good for America; Good for American farmers
More than 14 million barrels a day. That’s how much foreign oil we import in North America. Meanwhile, farm input costs have doubled in the last two years...

What's New
Sustainable Oils to Supply 100,000 Gallons of Camelina-based Renewable Jet Fuel to U.S. Air Force 10-01-2009

Domestic, renewable and low-carbon fuel selected to power military aircraft
October 1, 2009 - Bozeman, MT - Sustainable Oils, a producer of renewable, low carbon and domestically produced camelina-based fuels, announced today it has been awarded a contract by the Defense Energy Support Center (DESC) to supply camelina-based jet fuel for the Air Force. The contract is for 100,000 gallons of HRJ-8 beginning 2009 through 2010, and includes an option to purchase an additional 100,000 gallons between June 2010 and December 2012.
Production Recommendations

- Varieties from Montana State through Ernst Seeds
- Seed by broadcast and pack or very shallow drill. Seed @3-5 lbs/acre
- Fertility requirements are less than 1/3 of canola (similar to oats, 0 to 60 lbs N/acre)
  - 25-30 lbs P2O5/acre, 20 lbs S/acre
- Seeded early: seedling plants are very tolerant to cold (15-25F)
Production Recommendations

• No residual herbicide to control broadleaf weeds
• Poast- (a postemergence grass control product) was recently labeled for camelina
• Insects do not appear to be a big problem at this time
• Downy mildew could be a problem
• More resistant to woodchuck damage and shattering than canola
Production Recommendations

• Harvest in July with spring plantings
• Swath if lodging occurs, otherwise direct combine
• Harvest at 10 percent moisture with conventional combine
• Clean seed before crushing
No-till Seeding 4/17/08 Crawford County
Harvesting – 28 July
Very Little “Straw”
Bin w/Perforation Floor & Air
Volunteer Seed Lost During Combining Germinates with 1st Rain
Challenges

• Economics of single crop camelina
• At 1000-1500 lb/acre not competitive with other crops
• Are there ways to fit it into crop rotations to provide economic benefits?
  – To facilitate cover cropping
  – As a nurse crop
  – As a double crop following wheat or oats
Cover Crop Production after Camelina

- 8 strips, three 15 foot passes & 1.5 acres each
- Planted August 20, 2008
- Winter cereals such as rye or wheat work
- Other crops need longer growing season
- Sufficient growth and winter hardiness questionable for legumes and annual ryegrass
- Tillage radish, oats, sunflower, and sorghum sudangrass will all winter kill
Oats & Tillage Radish
Camelina as a Nurse Crop with Red Clover
Harvest–2 Aug & Clover in Stubble
Summary

• Camelina is an old world crop
• Camelina is a new potential crop for PA
• Future objectives should focus on:
  – Increasing yield performance
  – Assessing double crop performance
  – Finding new ways to add value
Thanks for your attention. Questions?

Where trade names appear, no discrimination is intended, and no endorsement by the Penn State College of Agricultural Sciences is implied.