

Brassicaceous Seed Meals as Soil Amendments

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Introduction

The extraction of oil from seed of brassicaceous crops such as canola and mustards leaves **brassicaceous seed meal (BSM)** as a by-product. As the production of **oil seed for biodiesel** increases, so will the production of BSM. Currently BSM is used primarily for livestock feed, but it has higher value as an **organic nitrogen fertilizer, organic herbicide, or organic fungal disease suppressant**.

Sources and quantities of BSM:

- Washington State in 2007 produced 10,300 tons of canola and mustard seed.
 - After oil extraction, 52-60% of material remains as BSM
 - = approx. **6,000 tons BSM currently** available annually
- Volumes could increase.
 - WA state govt uses 20% biodiesel => **20,000 tons BSM**
 - Public and private use in WA at 20% => 1 million tons BSM
- Custom crushers are available to produce BSM on contract.

Justification:

- Value-added sale of BSM is necessary to economically produce oilseed biodiesel.
- BSM contains plant nutrients (6-2-0), has weed control and pest control activities.
- BSM as a pesticide improves worker safety (GRAS)
- BSM from non-GMO varieties can be approved for use in certified organic production as fertilizer or pesticide.

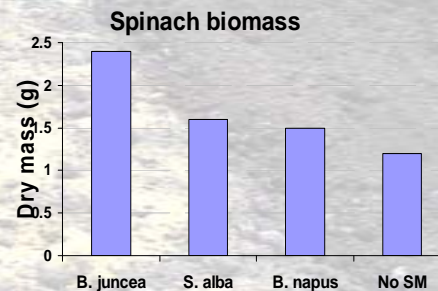
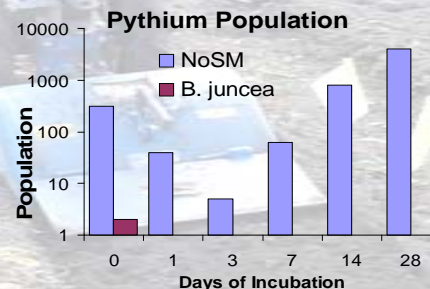
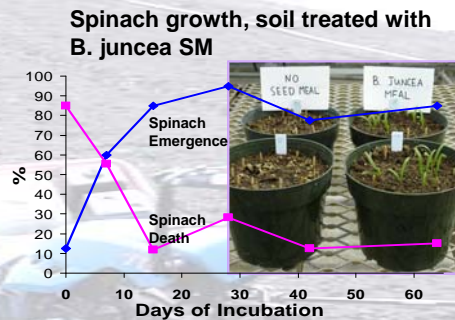
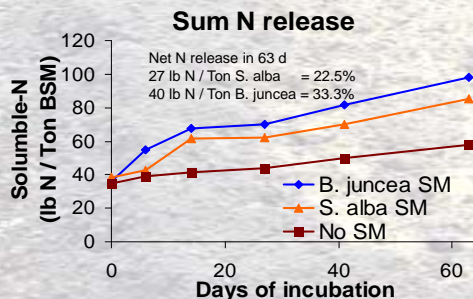
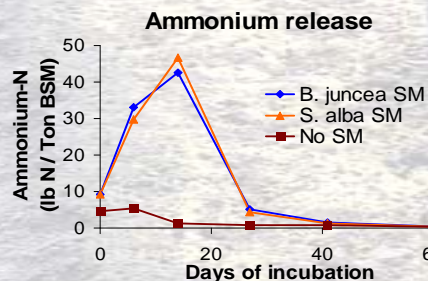
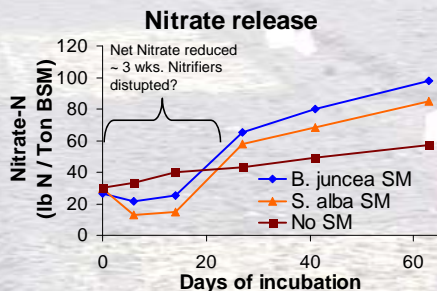
Refined product potential:

- 100% of BSM produced could be used, with no waste
- As fertilizer or biocontrol, 1-2 tons/acre = 3,000 -6,000 acres can now be treated.
- With >100,000 certified organic acres in WA, **demand could outstrip supply**

System requirements & competition for raw materials:

- Oilseed crushers are available from several sources in US for about \$40,000, used, up to \$140,000 or more.
- The primary competing use for BSM is as livestock feed. BSM and mustard seed are also used for condiment mustard and for the production of essential oil of mustard.

Key Research Findings



Additional environmental issues:

- BSM could replace or reduce methyl bromide.
- BSM adds organic matter to the soil.
- N bound in organic forms is less likely to leach or pollute water.

Jobs/economic development:

- Jobs created in farming, crushing, transporting, marketing
- BSM potentially more valuable than the oil

Closest commercial example:

- Corn gluten as weed & feed
- B. carinata seed meal as fertilizer

Development stage and timeline to commercial success:

- Registration as a fertilizer takes a matter of months
- Use of BSM for pesticide still requires much research and development to obtain consistent results
 - Inoculation with Pythium may be needed
- Registration as a pesticide will take a matter of years and millions of dollars

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