

Caliente Brand Mustard

For green manure and bio fumigation



Caliente Brand Mustard distributed by:
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Alternative Technologies

Green manuring, a traditional technology, is the tilling of fresh plant material into the soil. It is the process, used by farmers since at least the 5th century BC and improves the soil and the growth of the next crop.

Over the past century, most farmers have replaced green manuring with the use of synthetic inorganic fertilizers.

Recently, however, a growing number of innovative farmers have returned to this old technology, but with one important difference; they use **Caliente Brand Mustard**.

The benefits are impressive. Research and commercial use of the Caliente Brand Mustards in a rotation shows:

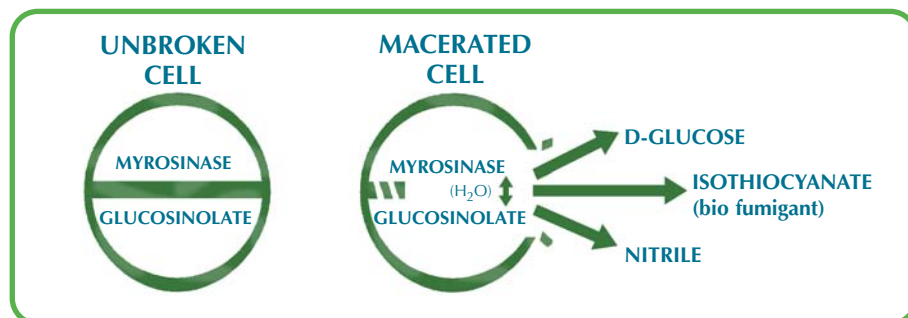
- * Improved soil qualities, reduced wind erosion and increase water infiltration and holding capacity.
- * Some weed suppression.
- * Some nematode suppression.
- * Suppression of Verticillium wilt, Silver Scurf, and *Sclerotinia* in **Potato production**.
- * Suppression of root rots (*Pythium*, *Fusarium* and *Rhizoctonia*) and *Sclerotinia* in **Bean production**.
- * Suppression of *Sclerotinia minor* and *Pythium* in **Lettuce production**.
- * Suppression of Pink root and *Sclerotinia* in **Onion production**.
- * Reduced disease pressure from *Aphanomyces*, *Pythium*, *Rhizoctonia*, *Fusarium* and *Sclerotinia* in **Pea rotations**.
- * Affects Cavity spot, Root rots, *Fusarium* and *Sclerotinia* in **Carrot production**.
- * Highly effective against Take-all of **Wheat**.

These many benefits are attracting an increasing number of growers across the globe. They are using **Caliente Brand Mustards** to improve their soils and manage soil-borne pests, control wind erosion, increase infiltration, improve crop yields, and they hope, increase profits.

Unlike synthetic fertilizers, Caliente Brand Mustards can improve the soil's physical, chemical, and biological qualities.

In contrast to the low input, low management, low yielding green manures of the past, Caliente Brand Mustards do require fertilizer, irrigation, and management. They also require a current understanding of soil ecology, soil-borne pests, plant biochemistry, breeding and screening techniques.

The biofumigation process.



Varieties:

There are a number of varieties available in the **Caliente Brand Mustard** range to suit different climatic conditions, crop pests and cropping programmes.

Caliente Brand Mustard 119

- * The best all round variety with a proven track record for all cropping areas.
- * First developed for the potato industry now with over twelve years experience in the field.
- * *Recommended seeding rate: 15 kg/ha*



Caliente Brand Mustard 99

- * New
- * This is the hottest of the blends because of its very high glucosinolate levels (30% more than CBM 119).
- * Fairly tolerant to poor growing conditions.
- * *Recommended seeding rate: 10 kg/ha*



Caliente Brand Mustard 61

- * Extensive root system
- * Longest season, slowest bolting
- * Temperature sensitive, (likes warmth)
- * Big biomass (large leaves)
- * *Recommended seeding rate: 8 kg/ha*

Nemat Eruca sativa

- * Specific Nematode catch crop (*Meloidogyne spp* and *Heterodera spp*).
- * High glucosinolate levels even in the roots.
- * Reasonable biomass.
- * Has the possibility of longer season growth with mowing.
- * Highest and lowest temperature tolerance.
- * A degree of drought tolerance.
- * *Recommended seeding rate: 8 kg/ha*

Our crops are bred and selected (by ISCI, Bolonga, Italy) to produce large amounts of biomass and high levels of the specific desirable glucosinolates and enzyme (myrosinase) that are needed for the crops biocidal attributes.



When used properly as part of an integrated pest management programme, Caliente Brand Mustards, which contain varieties protected by breeders rights, can reduce pest pressure whilst improving soil health and structure.

The ability of Caliente Brand Mustards to reduce pest pressure and improve soil quality will vary with, soil type, management technique, weather conditions, production timing and existing pest pressure. We recommend that growers evaluate their own situation before relying on these products for pest control.



Cultural and planting practices:

Seed placement:

Stubbles and prepared ground:
Broadcast or direct drilled.

- * A reasonable seedbed is necessary.
- * Seed should be shallow drilled and rolled, or
- * Broadcast (shallow harrowed) and rolled. (5-10 mm seeding depth max)

The aim is to produce a seedbed that will remain fine after crop incorporation enabling a good seal to be achieved.

Fertilizer:

- * The Caliente Brand mustard crop needs between 120-140 kg/Ha nitrogen (100-130 units/acre) depending on soil type and previous cropping
- * The entire N should be applied at or immediately after sowing
- * Sulphur levels vary greatly by soil and geography. This crop like most brassicas needs sulphur. As a guide this should be applied at a 1:5 ratio with nitrogen
- * It is important to understand that this is a crop that will produce large quantities of biomass and therefore needs feeding
- * This fertilizer will be paid back in subsequent crops.

Irrigation:

- * Good irrigation is an essential to establish the crop
- * Where irrigation is possible the crop needs to be adequately watered throughout germination and then as required to keep soil moist
- * This is not always possible with non irrigated land and in this case drilling should be timed with weather patterns

If there is not adequate moisture the crop will not grow to its full potential.

Incorporation:

- * Growing time will vary with time of year and climatic conditions
- * At Maturity vertical growth will stop
- * If grown to full potential the crop will achieve a height of approximately 2 metres equating to 100-150 t/Ha gross biomass
- * As a guide, after the first bloom, seed ripening will take between 28 and 42 days
- * A flail mower with hammer blades for maximum cell destruction should be followed by cultivation to incorporate, ideally to a depth no greater than 150 mm, producing a fine tilth and then rolled to seal in the Isothiocyanate gas
- * The soil must be moist for incorporation
- * Either irrigate (approximately 25 mm) or incorporate on a wet day.
- * Moisture at incorporation is paramount to produce the gas as it is a reaction that requires water

Post Incorporation:

- * Leave for 14 days before drilling
- * Ideally perform a cress test before drilling
- * Drill as soon after the 14 days as possible to achieve greatest effect
- * Avoid ploughing and excessive cultivation before following crop

The varieties used are all soft seeded and therefore volunteers will not be a problem in following crops unless the seed is permitted to ripen.

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