Tame Mustard Production

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Mustard is a cash crop that can be planted in rotation with small grains. Mustard is available in three types: yellow, brown and oriental. Yellow mustard (Sinapis alba) is the most common type grown in North Dakota. Only small acreages of brown and oriental (Brassica juncea) are being grown. Yellow mustard is used for a table or “hotdog” mustard, while brown and oriental are used for oil and spices.

All mustard should be grown under contract, assuring the producer of a guaranteed market.

Adaptation

Mustard is best adapted to fertile, well-drained soils. Coarse-textured sands and sandy-loam soils should be avoided because they tend to be droughty. Yellow mustard varieties mature in about 85 to 90 days, whereas the brown and oriental types require about 90 to 95 days to reach maturity. Mustard usually will yield best when sown into small grain stubble.

Small grain crops following mustard in rotations usually will yield better than if following small grains. Crops such as sunflower, canola, safflower, dry bean and soybean are not recommended in close rotation with mustard because all are susceptible to sclerotinia (white mold).
Mustard Growth Characteristics

Mustard seedlings emerge rapidly but tend to grow slowly, leaving the ground initially exposed to water and wind erosion. Under favorable moisture and temperature conditions, the ground will be covered in four or five weeks. Five weeks after emergence, the plants begin to bud. The crop will appear to be rather uneven at this stage of development. A week to 10 days later, it will develop into full yellow bloom, and the plant stand will appear more even.

Good moisture supplies and cool temperatures favor a long flowering period. The longer the blooming period, the higher the yield potential. Fully grown plants usually vary in height from 30 to 45 inches, depending on type, variety and environmental conditions.

Seedbed Preparation

A prepared seedbed for mustard should be firm and fairly level. Shallow tillage, just deep enough to kill weeds, will keep soil moisture close to the surface and leave the seedbed firm. This will permit shallow seeding and encourage rapid, uniform emergence. Producers have planted mustard successfully into standing small grain stubble and minimum-tilled stubble. The firm, moist seedbed has resulted in good stand establishment.

Varieties

Yellow mustard varieties tend to be shorter, earlier maturing and lower yielding than brown or oriental varieties. Seed for planting desired varieties usually is available from contracting firms. See Tables 1 and 2 for variety information.

Seeding Date and Rate

Early seeding is recommended but should be late enough to avoid damage from spring frost just after emergence. Seeding should occur from April 20 to May 15, with planting later than May 15 usually resulting in lower yields.

Yellow mustard has approximately 100,000 seeds per pound and is seeded with a grain drill or air seeder at the rate of 10 to 14 pounds per acre. The higher rate should be used on heavy, fertile soils or soils where emergence could be a problem. Oriental and brown mustards, which have a smaller seed – about 200,000 seeds per pound – should be solid-seeded at a rate of 6 pounds per acre.

A double disk-opener press drill or air seeder can be used to seed mustard, but depth control is critical for seed placement. Mustard seeds are small and must be planted shallowly (½ to 1½ inches deep) in moist soil and a firm seedbed to ensure rapid germination and emergence. Soil crusting prior to seedling emergence can cause problems. If mustard stands are poor, decisions to replant should not be delayed.

Fertilizer

Mustard responds to nitrogen (N) and phosphate fertilizer in a manner similar to small grains. Consult “Fertilizing Canola and Mustard,” an NDSU Extension publication at www.ag.ndsu.edu/publications/crops/fertilizing-canola-and-mustard/sf1122.pdf, for mustard fertilization recommendations based on soil tests.

Weed Control

Weed control must be based on clean field selection and shallow seeding for quick and uniform emergence to obtain a good, uniform stand. The mustard crop should not be harrowed, rotary hoed or tilled after emergence.

Weeds are a serious problem in mustard production. They not only reduce yields, but weed seeds such as wild mustard, wild buckwheat and foxtail, as well as canola, are difficult to remove and can cause severe cleaning losses and market grade reductions. Such losses reduce profits to the grower.

Mustard plants are sensitive to herbicides such as 2,4-D, Banvel, MCPA, glyphosate, and most ALS herbicides, including imidazolinone and sulfonyleurea-type herbicides. Spray drift and sprayer tank contamination must be avoided.

All mustards, but especially the oriental and brown types, should be sown on fields known to be relatively free of wild mustard infestation. Wild mustard can...
Insecticides labeled for control of insects in mustard are listed in the current year of the NDSU Extension publication "North Dakota Field Crop Insect Management Guide" (E1143), and always follow the directions on the label.

Insects
Insects can cause serious yield losses, and growers should monitor fields closely for potential problems. Flea beetles and diamondback moth caterpillars have been the most troublesome insects.

Damage to mustard seedlings can be caused by early season feeding by overwintered flea beetles. Flea beetles are shiny, black, jumping beetles about \( \frac{1}{8} \) inch long. The adult beetles feed on the cotyledons and first true leaves, causing the typical shot-holed appearance. Severely damaged seedlings may die, while less seriously damaged plants often suffer a reduction in vigor and stamina.

Hot, sunny weather is conducive to feeding activity, while cool, damp weather slows feeding and favors crop growth. Hot and dry weather may cause damaged seedlings to wilt and die, causing partial to complete crop loss.

In some instances, the infestation of a field can occur as a creeping movement from plant to plant across a field; in other instances, the entire field may become infested quickly and evenly. Once the crop advances beyond the seedling stage, economic damage usually does not occur because vigorously growing mustard can outgrow the beetle defoliation.

Mustard generally is less susceptible to adult feeding injury than canola. No major effects on plant vigor have been noted from the feeding of the larva on plant roots. Cultural methods can help reduce plant losses caused by flea beetles. Early planting and a firm seedbed and adequately fertilized will help plants outgrow beetle damage during the susceptible early season stages.

A few flea beetles or scattered shot-holing are not necessarily cause for alarm. However, if defoliation is greater than 25% of the surface area of cotyledons and first true leaves and beetles are numerous, immediate control likely will be required.

Diseases
Several diseases attack mustard. Among the most serious is sclerotinia (white mold). Including mustard in crop rotations containing crops such as canola, dry edible bean, sunflower or safflower is risky. That’s because these crops have similar white mold problems, so disease infestations can build to economic levels.

Mustard grown in a small grain rotation is one of the best preventative of serious disease problems and provides an excellent biological break for cereal grain leaf diseases.
the threshed seed. If cracked mustard is present, it will adhere to the hair on the back of your hand, indicating the need for further combine adjustment.

To optimize seed quality, the combine should be adjusted so the seeds are threshed completely while using the lowest possible cylinder speed. Cylinder speed should be set at approximately 600 rpm. Careful adjustment of the cylinder speed and cylinder opening is important to avoid cracking.

If the crop is very dry, every other cylinder bar may have to be removed. Cylinder speed may need to be varied during the day as crop moisture content varies. Fan speed should be reduced to limit seed loss with the straw, yet maintain sufficient air to ensure clean mustard grain for market.

### Storage

Mustard seed can be stored safely when the moisture content reaches 9% or less. Take care to avoid cracking the seed while moving the crop in and out of storage. When drying, do not to exceed air temperatures of 150°F or seed temperatures of 120°F. Mustard seeds are very small, so tight bins, augers and truck boxes free of cracks or holes are essential for transfer and storage of mustard.

### Utilization of Mustard

Yellow mustard mainly is used in the meat packing industry as an aid to flavor, emulsification, water binding, slicing and texture in hot dogs, bologna and other processed meats. Ground yellow mustard can absorb excess fats and fluid (approximately 4.5 times its own weight) and also is used with seasoned hamburger, meatloaf, liver sausage, chili, various canned meat products and some table mustards.

Oriental mustard is used primarily in Chinese mustards. Some spice-blending houses use it as an ingredient for its hot, pungent flavor. It is an essential ingredient in mayonnaise, certain salad dressings, barbecue sauces, baked beans, steak sauces, relishes and many other flavoring sauces.

Brown mustard has limited uses in hot, spicy table mustards and other seasonings.