



Spring Cereal Grains: Getting Ready to Plant

Barley, Oats, Spelt, Spring Wheat

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This time of year, we're treated with glimpses of spring sunshine and reminded that we should start thinking about preparing for the growing season. To be ready for planting of spring cereal grains you will have wanted to select your field, ordered high quality and adapted varieties (or cleaned and tested your own), prepared the seedbed, calculated seeding rates, and gotten your equipment in order.

Keep in mind that the success of your planting will depend on soil temperature and moisture, and of course each spring's weather brings different challenges. However, planting grains as early as possible will improve the chance of establishing a crop ahead of potential competing weeds and hot temperatures both hopefully resulting in higher yields. As long as the ground is not too water-logged, some springtime moisture will be beneficial to seed germination and early growth. Cereal grains can be planted at cooler soil temperatures than other crops, so planting can take place in the very early part of spring. The information in Table 1 should provide a quick reference for spring cereal grain requirements.

Table 1. Spring cereal production information for New England

Grain	Planting date	Soil Type	Seeding rate per acre	Harvest date	Test weight per bushel	Yield per acre	Storage moisture %
Barley	Early to Mid-Apr.	Light or well-drained	60-125 lbs	Early August	48 lbs	60 bu	12.5
Oats	Early April	Well-drained	90-100 lbs	July	34-38 lbs	80 bu	12-12.5
Spelt	April	Poorly-drained	160-180 lbs	Mid-July, Early August	40 lbs	90-100 bu	14
Spring Wheat	April	Well-drained	90-180 lbs	August to September	60 lbs	40 bu	13

Site Selection

Site selection should be considered in the autumn prior to the new growing season. You should have your soil tested and determine, based on the results, which field will meet the requirements of your desired crop. Decide how many acres of each grain you will want to grow and examine what land you have available, so that you match soil type, field size, and location to your specific crop needs. In selecting your site, you should keep crop rotation in mind, so that you consider what was growing in a certain field previously and what might grow there in the future. To minimize disease and insect pressure, cereal grains should not be grown in fields that previously grew cereal grains or other related crops such as corn.

Small grains are well-adapted to a variety of soil types but ultimately all prefer well to moderately-well drained soil conditions. If you want to be planting spring grains in mid-April

you will most likely have the best chance of succeeding if the selected field is well-drained. A heavy clay soil would be best used for fall seeded grains where there is a bit more flexibility in planting date. In general, barley is sensitive to water logged soils so it would be best to plant these in well-drained areas. Oats and spelt have better tolerance to wet soils and hence you could plant these on heavier textured soils.

Readying the Seedbed / Soil Fertility

Because spring cereals need to be planted early, much of your seedbed preparation should take place in the fall. This way, as soon as soils are warm enough, you can be out planting on a smooth and fertile field. Your planting equipment will operate most efficiently on land that is friable, even, and free of rocks and debris. If you're growing spring cereals, amendments will work best when fall-applied, since you won't have much time in the spring to prepare your seedbed before planting.

When you have your soil tested in the fall you will find out what nutrients need to be added to meet the demand of the crop. Your pH for most cereal grains should be about 6.0, although some crops will tolerate lower pH levels. The majority of your soil amendment (including the addition of lime and/or compost mixtures) should be undertaken in the fall, so that the soils are ready for spring cereals. Most cereal grains are light feeders and do not require a great deal of input, and some, like spelt, can do very well in medium to poor soils. In fact, growers should avoid adding soluble fertility in the form of raw manure and be careful not to add too much nitrogen, as this can cause an abundance of weeds and also weak grain stems that could eventually result in lodging.

Ordering Seed

Putting together your seed order for the season will take a good amount of planning, research, and phone calls. Spending time purchasing high quality seed will pay off, however, with higher yields and quality during the growing season.

There are a few important distinctions when it comes to buying seed. "Certified seed" will have been checked for disease (distributors will scout the grain fields for problematic diseases before harvesting seed grain) and should be free of diseases like loose smut, *Fusarium*, and *Sclerotinia*. It should also be free of weed seed and have been checked for germination. "Certified organic seed" does not mean the same thing—it has not necessarily been tested for disease, weeds, and germination. Variety selection should be primarily based on its ability to perform well in your growing climate. Once you find these varieties using local University of industry variety trial data you will want to fine tune your selections based on farm production goals. For example, if you have issues with *Fusarium* head blight you might choose to grow a variety that is less susceptible to the disease. If you are growing for a specialty market you may want to select a variety high in protein levels. Local variety trial results for New England can be found at the Northern Grain Growers Association website.

Here is a partial list to get you started with some options for ordering grain seed:

- Butterworks Farm, Westfield, VT (www.butterworksfarm.com)
- Wood Prairie Farm, Bridgewater, ME (www.woodprairie.com)
- Seedway, Elizabethtown, PA / Shoreham, VT (<http://www.seedway.com>)

- Grand Falls Milling, Grand Falls, NB Canada (<http://www.grandfallsmilling.com>)
- McCardle Brothers, Kinkora, PE Canada (<http://www.mccardleseeds.com>)
- Semican Internation, Plessisville, QC Canada (<http://www.semican.ca>)
- Albert Lea Seed, Albert Lea, MN (www.alseed.com)
- Lakeview Organic Grain, Penn Yann, NY (<http://www.lakevieworganicgrain.com>)
- JGL, Inc., Plymouth, IN (<http://www.jglinc.com>)
- Welter Seed & Honey, Onslow, IA (<http://www.welterseed.com>)

Small-scale growers can also order seed from the following sources:

- Kusa Seed Society, Ojai, CA (<http://www.ancientcerealgrains.org>)
- Prairie Garden Seeds, Humboldt, SK Canada (<http://prseeds.ca>)
- Heritage Grain Conservancy, Waterville, ME (<http://growseed.org/seed.html>)
- Johnny's Selected Seeds, Winslow, ME (www.johnnyseeds.com)
- Sustainable Seed Company, Petaluma, CA (www.sustainableseedco.com)
- many local farm & garden stores

Testing Your Own Seed & Calculating Seeding Rate

If you've saved last year's seed to plant this year, you should make sure it's been stored properly, tested for disease, and checked for seed viability. It is very important to clean and save your seed in a way that prevents contamination or spoilage. For growers, this will require monitoring fields for disease prior to harvesting, thoroughly cleaning harvesting equipment and storage facilities before using them, paying extra attention to moisture levels throughout the duration of storage, and taking precautions to keep insects and rodents out of the grain. If you are growing organically and saving your own seed, you will want to be very careful about scouting your fields before you harvest and minimizing the risk of contamination, as disease can spread quickly and be undetectable in seed grain.



If some of your seed grain is chaffy or light, it may not germinate. Before planting, you can conduct your own germination tests quite simply by placing a known quantity of seed in a moist paper towel and leave it in a dark and cool location for about a week. After a week, you can count the number of seeds that have sprouted and calculate the percentage of seed germinated. You will want to do a few tests for each variety to get the most accurate calculation of percent germination. Knowing your seed viability will help you calculate an accurate seeding rate. Seed quality will impact seeding rates, and low quality seed will need to be planted in greater quantities to achieve the same ultimate plant populations. Most given seeding rates assume a germination rate of at least 90%-- if your germination rate is lower, calculate a seeding rate adjustment as follows:

desired seeding rate (lbs/acre) / percent germination = adjusted seeding rate

example: Oats, seeding rate of 95 lbs/acre, with a germination rate of 75% ...

$$95 \text{ (lbs/acre)} / 0.75 = \underline{126.67 \text{ lbs/acre}}$$

You may want to increase your seeding rate if weeds have been highly problematic in a certain field, if you are broadcasting seed, or if you get a late start with planting. Seeding rates can be

determined based on desired plant population, germination rates, row spacing, soil type and condition, and kernel weight.

Preparing Your Equipment

Whether you're planting with a grain drill or broadcasting, you will want to make sure your equipment is in good working order and calibrated properly for your seed type and size. Inspect your planter well before you head to the field, so that if it needs repairs or adjustments, you'll be ready when the sun is shining. Whatever type of planter you use, you will want to evaluate and replace sprockets and chains regularly, calibrate seed meters (recommended annually), check air pressure in tires, and confirm that the planter is functioning properly.

A grain drill is a good option for cereal grains, especially on a large scale. Drills can come in a variety of sizes and use a seed-metered device to distribute seeds at a pre-set rate as the planter is towed behind a tractor. Row-spacing of grain drills is generally between 6 and 7 ½ inches.



Some grain drills allow growers to inter-seed another crop simultaneously, having a separate legume or grass seed box that can be independently adjusted for seeding rate of a grass or legume crop to help minimize weeds and establish a hay or cover crop. Because there is so much adjustment possible with a grain drill, it is important to make sure the settings are correct for each crop that you will plant, as well as for the soil conditions at planting. You can adjust accordingly for seeding rate, row spacing, and drilling depth. Many grain drills, because of their adjustability, can

be used for either conventional or reduced tillage planting. Growers who do not have a grain drill can research to see if there is one available to borrow or rent in their community, or possibly hire a contractor to plant for them. Others may choose to broadcast seed, but should note that seeding rates should be adjusted accordingly.

Some helpful resources:

- UVM Extension Crops & Soils Program-- <http://www.uvm.edu/extension/cropsoil>
[latest UVM research on grains, including variety trials, information on cultivating, fertilization, and harvest dates]
- Northern Grain Growers Association-- <http://northerngraingrowers.org>
[information on the organization; on growing, harvesting, processing, and storing specific grains; and lots more!]
- Logsdon, Gene. 2009. *Small-scale grain raising*. White River Junction, VT: Chelsea Green Publishing
- Wallace, Janet, ed. 2001. *Organic field crop handbook*. 2d ed. Ottawa: Canadian Organic Growers.