

Seeding Rates and Seeding Tips for Lentils

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Lentils are a crop of interest for experienced and new growers. John Ippolito, Crops Extension Specialist, Saskatchewan Ministry of Agriculture in Kindersley and Saskatchewan Pulse Growers provide some tips on seeding rates and seeding for lentils.

Seeding Rate

The recommended seeding rate for lentils is a target plant stand of 130 plants per square metre (m²) or 12 plants per square foot, for all types of lentils. The seeding rate is determined by the thousand kernel weight of each variety, which can vary substantially depending on variety, and an estimate of survivability. Generally the range of plants lost is estimated to be between 10% and in extreme situations 30%. For most small red varieties, seeding rates would average 55 to 60 pounds per acre (lb/ac) and the large greens would average 90 to 95 lb/ac, assuming some plant losses and average kernel weights. Higher seeding rates may show to be a benefit in some areas, depending on conditions and disease risks. In moister areas where *Sclerotinia* can be a problem, higher seeding rates increase canopy density, which may increase risk of disease and affect penetration of fungicides into the dense canopy.

Research from the University of Saskatchewan led by Dr. Steve Shirliffe compared five different seeding rates (60, 120, 180, 240, and 320 seeds per square metre) across different classes of red and green lentils (large green and red, medium green, small green and red, and extra small red), disease development and ultimately, crop yield. Preliminary findings show optimal stands at approximately 180 seeds/m² and higher yields, regardless of wet or dry years, and up to 240 seeds/m² for some of the lentil classes, such as red lentils. Narrower row spacing, less than 12 inches, has also shown increases in crop yield. Seeding rate recommendations are available and an economic analyses was completed to help growers determine what rates will be the most productive and economical.

Seed Early

Lentils should be seeded early, as soon as the soil temperature at seeding depth is 5°C or greater, and the soil is not excessively wet. This would be slightly warmer than the soil temperatures required for germination and emergence of peas. Depending on spring weather conditions, seeding too early into colder soils may result in the seeds sitting in the soil and when they do germinate those plants can be stressed to some degree.

Lentil seedlings do have good frost tolerance and have survived temperatures of -4 to -6°C. Even if frost is severe enough to kill the main shoot, the lentil plant can regrow from one of the scale nodes at or below the soil surface. However, with regrowth expect delays in crop staging and maturity, and avoid herbicide applications until plants have had a chance to regrow.

Early seeding encourages crops to grow in the cooler part of the year and may help avoid flower blast caused by high temperatures during flowering. Early seeding may also increase the height and size of the plant at time of first bloom, allowing the lower pods to develop

further above ground to ease harvest. The longer the maturity (less determinate varieties), the more important it is to seed early.

Seed Quality

Start with high quality seed for establishing a rapidly emerging, vigorous stand, and producing a high quality, profitable crop. In addition to good germination and vigour, pay attention to disease levels.

Seed Handling

Lentil seeds are susceptible to mechanical damage during handling. Handle lentil seed as gently as possible, especially if the seed is on the dry side. Dry lentil seed (14% or less seed moisture) is brittle and difficult to handle without chipping and splitting the seed. Even nearly invisible seed cracks can result in a reduction in germination. Reduced speed while seeding often results in better lentil stands. On-row packing to ensure good soil contact with the seed is recommended.

Seeding Depth

Lentils should be seeded 2.5-7.5 centimetres (1-3 inches) deep into moisture and never seeded at the interface where moist soil meets dry soil. Lentils need to have at least an inch of moist soil on top of the seed because they require a fair amount of moisture for the seed to swell and germinate.

Growers planning to use Sencor® as a post emergent application are advised to seed deeper. If it rains shortly after a Sencor® application, the product can be taken up by plant roots and set back plant growth. Seeding a bit deeper helps reduce the potential for root uptake of the herbicide.

Seed Treatment

Seed-borne *Fusarium*, *Sclerotinia*, and *Botrytis* can cause seedling blights, and combined seed-borne levels of above 10% requires a seed treatment. With *Aschochyta*, a seed treatment is recommended if seed-borne disease levels are 5-10%. However, this disease is not as common in lentils anymore because the genetic resistance in most current lentil varieties is quite good. Anthracnose disease is on the rise in lentils. This disease is not highly seed-borne and the seed-to-seedling transmission is considered low in lentils. There is no seed treatment for Anthracnose, therefore Anthracnose-infected seed should not be planted in a field where lentils have never been grown.

One relatively new disease in the root-rot complex is *Aphanomyces* root rot, a long-lived soil-borne disease affecting lentils and peas. This disease is particularly aggressive under wet conditions. There are limited chemical controls available, however if growers are planting in fields that are high risk, then consider a seed treatment that has activity on the pathogen. A typical lentil rotation is one in four years. However, with *Aphanomyces* root rot, the rotation for lentils or peas should be extended to a minimum of one in six to eight years in fields where *Aphanomyces* has been detected.

Inoculation

Lentils inoculated with the proper *rhizobium* (bacterial) strain has the potential to fix up to 80% of its nitrogen requirement through nitrogen-fixation. Growers should use an inoculant for lentil production. For new lentil growers, inoculation is very important, particularly if going into fields that do not have a history of peas or lentils.

One caution, there can be some negative interaction between inoculants and seed treatments. Always follow recommendations from the inoculant manufacturer. This particularly applies to liquid or peat-based inoculants that are applied directly to the seed. Granular formulations may be less of a concern as they are applied to the soil.

Fertility

Phosphorus is important for early crop growth, nitrogen-fixation, and crop maturity. The recommend safe rate for lentil is maximum 20 pounds per acre (lb/ac) of phosphorus in the seed row based on one inch seed spread and nine inch row spacing under good moisture. In some fields, starter nitrogen may be required if the field is below 15-20 lb/ac based on soil test results. The fixation process takes three or four weeks to get going, so in low nitrogen soils some starter nitrogen can help with early plant growth. Growers should not exceed a total of 30 lb/ac available nitrogen between the soil test amount and the applied fertilizer amount. In a wet year too much nitrogen can enhance vegetative growth, which can lead to increased disease pressure and may also delay maturity.

Rolling

Lentils should be rolled to push down rocks and smooth out lumps, which will contribute to a smoother harvest and reduce the risk of seed tag at harvest. Rolling can be done anytime from right after seeding up until the seven node stage. Land rolling past this stage can damage plants, increase the spread of foliar diseases, and reduce yield. If the field has lots of residue, then rolling can be done immediately after seeding, as soon as the soil surface is dry. However, in fields with low residue levels, waiting until the plants are established will reduce erosion risks, especially if the soil surface is very dry.