



Niger response to nitrogen and seeding depth

CATEGORY [agronomy](#) | October 21, 2020

Niger grain yield increased linearly by 18% with increasing nitrogen rates. Seeding depths down to one inch (2.5 cm) allowed placement of seed into soil moisture to support emergence and optimize yield.

Niger is an open-pollinated oilseed crop, and was domesticated in Ethiopia. While niger is a major oilseed crop in India and Ethiopia, niger is used for birdseed mixtures in North America and Europe. Niger production on the Prairies is found mainly in Saskatchewan.

The objectives of this research were to determine the response of niger to N fertilizer under a no-till cropping system in Saskatchewan, and to determine the impact of seeding depth on crop development and yield.

The research was conducted at Indian Head, Saskatchewan. The variety Earlybird was sown in late May or early June with a no-till drill with hoe type openers on 12 inch (30.5 cm) row spacing. Seeding rate varied from 5.8 to 9 lbs./acre (6.5 to 9 kg/ha) depending on the germination of the seedlot. The experiments were sown into wheat, oat, barley, or canola stubble.

In both trials, 18 lbs. PO_4^3 /acre (20 kg/ha), 9 lbs. K_2O /acre (10 kg/ha), and 9 lbs. SO_4^2 /acre (10 kg/ha) were sidebanded at seeding. Nitrogen was applied at a constant rate of 44.5 lbs. N/acre (50 kg/ha) each year during the seeding depth experiment.

The N fertilization experiment was conducted from 2012 to 2017. Five rates of N were applied in a sideband at seeding approximately 1 inch (2 to 3 cm) to the side and 3 inches (7 to 8 cm) below the seed. Rates were 9, 31, 53, 76, and 98 lbs. N/acre (10, 35, 60, 85, and 110 kg N/ha) Seeding depth was about 0.5 inch (1.3 cm).

A linear yield increase of 18%

Nitrogen rate did not impact plant stand establishment, indicating that the separation between seed and fertilizer during seeding was enough to protect the seed from damage as the N rate increased up to 98 lbs./acre Similarly, time to flower initiation was not affected by N rate.

There was a linear increase of 18% in grain yield as the N rate increased from 9 to 98 lbs. N/acre. Yield increased from 370 lbs. seed per acre to 438 lbs. seed per acre – an increase of 68 lbs. seed per acre (76 kg/ha). Test weight was not affected by N rate.

Seeding depth affected stand establishment but not yield

The seeding depth experiment was conducted in 2011, and from 2013 to 2017. Niger was sown at the soil surface, and at 0.25, 0.5, and 1 inch below the soil surface (0.6, 1.3, and 2.5 cm). The exception was in 2015 when niger was sown at soil surface, and 0.25, 1, and 1.4 inches below the soil surface (0.6, 2.5, and 3.5 cm).

Niger sown at the surface depth did better and was more consistent than was expected. Fifty per cent of the time plant density decreased as the depth increased. The seeding depth of 2.5 cm was the most variable of all the depths for plant density.

Days to flower initiation, plant height and kernel weight were not affected by seeding depth.

Grain yield and test weight were also not affected by seeding depth. Yield varied over the years from 426 to 453 lbs. seed per acre (478.8 to 509 kg/ha). Since seeding depth did not affect yield, the research concluded that seeding niger down to 1 inch deep into soil moisture is suitable for semiarid regions of Saskatchewan.

Funding was provided by AAFC. These trials were used by Mr. May as an on hands tool to teach undergraduate students who worked in the research program. Under some guidance, a student would be responsible for randomization, layout, seeder calibrations, seeding the correct treatments in the correct plots, data collection and harvest. Mr. Wood went on to do a Masters after finishing his undergrad. Ms. Del Pierro wrote the first draft of the manuscript as a co-op student in my research program.

May, W.E., Wood, M.D., and Del Piero, K. 2019. Niger Response to Nitrogen and Seeding Depth in the Northern Great Plains. *Agron. J.* 111:741-748

<https://access.onlinelibrary.wiley.com/doi/10.2134/agronj2018.08.0541>