

# Effect of species and seedtime on growth, development and yield of blue lupine (*Lupinus angustifolius*)

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Beginning from March 27 in 2018, we created a field trial on the area of the Julius-Kühn-Institute in Berlin Dahlem. The subject of the trial was a comparison of three cultivars of blue lupine (*Lupinus angustifolius*) which were sown on four different times in a weekly interval. The plot design fulfilled the requirements of a two-factorial strip-plot with six replicants. The factors were three cultivars of the blue lupine and the seedtime which differed on a weekly basis. The field trial was carried out under practical conditions on sandy loam using agronomic techniques like deep- and rotary-tilling to prepare a humogen seedbed. Phytosanitary measures were applied to avoid stress by weeds and pest infestation to keep the environment between the subjects of interest as similar as possible.

To quantify differences in the development of the alternatives, we took destructive samples on four determined growing stages using the BBCH-code for identification. To identify the right moment for the harvests there was consecutive observation carried out on at least three days a week on which the BBCH-Code for the 12 alternatives was determined and the plants height and number were analyzed in two defined micro – plots per sample. Once we took the samples, the plants were firstly separated in leaf and stem, and later on the generative parts were separated in legumes and

seeds. For better comparability, all samples were drought and weight as dry matter. Another subject of interest to quantify the growing rate was the Leaf Area Index. Starting from May 9 2018, it was determined on a weekly basis using a plant canopy analyzer.

With the collected data we are able to show the speed and length of growth-stages for the different alternatives. Also, we can determine the exact numbers of germinating plants and the amount of yield (including the amount of protein and fat for the seeds).

Besides the characterization of development and growing rate through the visualization of the data collected, the possible impact of cultivar and seedtime on the harvest and yield parameters were statistically verified using a Two-Way Analysis of Variance (ANOVA) using R-Studios.

Using this method, we find significant differences in yield, fat- and protein content in between the alternatives with a different sowing time. Also, the cultivars differ in development rate and yield and show unique reactions on dry conditions regarding the sowing time. One cultivar was superior in adapting to the dry conditions. For the evaluation one has to keep in mind the dry conditions in 2018 leading to differences in the availability of water between the variables.