

Cultivation of Chia (*Salvia hispanica* L.) in southwest Germany: A comparison of yield, morphology and mechanical harvest losses

Status

Completed

Duration

10.2019-03.2020

Description

Chia (*Salvia hispanica* L.) is a short-day plant, so the induction of flowering is triggered by a specific critical day length (<12 h). This characteristic limits the regions of cultivation for seed production to countries between 22°55' °N latitude and 25°05' °S latitude. However, a few years ago, experiments proved the existence of genetic and breeding variations, which also flower at day lengths between 14 and 15 hours. These new findings enable Chia cultivation at latitudes outside the tropics. First cultivation trials with early flowering or long day adapted Chia genotypes have already been carried out in Southwestern Germany with positive results regarding yield and quality. The primary goal of this work was to investigate and compare the yield data of the new long-day adapted Chia genotypes. The aim was to clarify which of these new genotypes are capable of achieving yields equal to or even higher than those of the countries of origin. Furthermore, it should be clarified whether and to what extent morphology differences there are. Of particular interest here is the extent to which certain morphological parameters influence chia seed yields (number of seeds per plant). With this knowledge, the morphology of the chia plants could be controlled by targeted culture managements. In such a way t chia plants could be cultivated in Germany efficiently, with stable yields and without major yield losses in the future. In order to realize the large-scale commercial cultivation of chia in Germany, mechanical harvesting systems are necessary. The most proven harvesting method for Chia seeds is the combine harvest. However, in previous trials in its countries of origin, it has been found that the threshing of Chia plants causes harvest losses up to 37%, which are due to "seed shattering". The difference between mechanical and manual harvesting results should be reviewed in this thesis, too.



- At the current state of breeding, significant harvest losses are to be expected for all genotypes tested when harvesting by machine using combine threshing (> 19%)
- The yields of the Golden Chia genotype (*Salvia hispanica* BENTH.) were significantly below the level of the *Salvia hispanica* L. genotypes due to the extremely pronounced seed shattering.
- The genotypes R2N 1.4, GHWW, GHWC and G8, based on their results in this experiment, provide the best conditions for use in German agriculture

Involved persons

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