

## **Economics of plant production on marginal sites in the state Mecklenburg-Vorpommern**

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Marginal sites are defined by economics. It is not possible to produce any profit there under given conditions of markets and policy even when management is optimized. In the state Mecklenburg-Vorpommern, a portion of nearly 20 % of arable land is characterized by such conditions. There are often to find sandy sites below 28 soil points with low storage capacity and irregular water supply.

Animal husbandry as a type of agricultural upgrading has a more important role in the south and southwest of the state than in the regions with better soil quality. The percentage of Maize was already in 2003 twice as high in the regions with more marginal sites. After implementation of the Renewable Energy Act many enterprises started built biogas plants. In 2010, the portion of maize was raised to 20 %. The increase of Maize was combined with a reduction of growing other fodder crops, rye and also by reducing set-aside areas. The scale of the cash crops Rape (16%), Wheat (15 %) and barley (9 %) stayed the same.

The yields and production processes of several selected farms in Mecklenburg-Vorpommern were analyzed for the years 2011 to 2016. The farms reached 6.6 tons per hectare of wheat and 6.1 tons per hectare of barley on soils below 28 soil points. Hybrid rye achieved 5.4 tons per hectare and rape 3.0. Maize was especially dependent on water supply and made between 30 and 35 tons per hectare.

The big problem in these regions is caused by high production costs in cropping. More than a half of the costs is required for seeds, fertilization and crop protection. However, the remaining revenues are not adequate for paying work and fix costs as an evaluation of farms in Mecklenburg-Vorpommern shows.

It is not a valid option to set more land that is arable aside in regions with much marginal sites because cropping is a strategic investment there. Therefore, it is important to make effort on crop rotations and optimization of production intensities to decrease costs per unit and to save a certain level of yields.

A calculation of crop rotations shows that the contribution margin of three-year crop rotations and four-year rotations containing maize is lower by 20 to 25 percent compared with crop rotations on sites with better soil quality. Besides the four-year rotations demonstrate that maize is able to increase the profit for farms. These rotations with maize obtain better contribution margins than cash crop rotations on the margin sites. Furthermore, maize will be a good instrument to come up to requirements on nitrogen balances in future.