

# NEW VARIETIES TO DEAL WITH THE GERMAN FERTILISER ORDINANCE

The revised provisions of the German Fertiliser Ordinance pose enormous challenges to farmers both in terms of storing slurry and making sure crops get an adequate supply of nutrients – especially in red zones where excess nitrogen levels have been recorded



The amended Fertiliser Ordinance 2020 sees a cap of 80 % imposed of the average farm nitrogen requirement. For oilseed rape with a yield potential of 4 t/ha and a nitrogen requirement of 200 kg/ha, this means that an application rate of just 160 kg/ha of nitrogen would be permitted under these new provisions. After deducting the soil's natural levels of mineral nitrogen the amount of N that can still be applied is about 120–140 kg – not forgetting that autumn applications

must now be included when calculating the quantity of crop-available nitrogen. This scenario has already been simulated in trials conducted by Deutsche Saatveredelung AG (DSV) in the last three years. At four trial sites in Germany and elsewhere nitrogen inputs were capped at only 60 % of the normal rates for the respective region, which translated into an average of approx. 120 kg N/ha.

The following results were obtained:

### 1. New, high-yielding varieties show better nitrogen efficiency than older hybrids.

Varieties that produce consistently high yields in varying climatic conditions and for a number of years provide the best nitrogen efficiency. These are generally the more recent varieties which have been selectively bred to perform better under current conditions thanks to improved disease tolerance or greater drought tolerance, which in turn is largely due to a better root growth. In DSV trials, new hybrids were found to have around 20 % higher nitrogen efficiency than the older standard varieties. Similar results were obtained in detailed scientific trials conducted by the research group headed by Dr Andreas Stahl of the Justus Liebig University Gießen. These trials showed that modern varieties require up to 28 % less nitrogen than older varieties to produce one tonne of rapeseed oil.

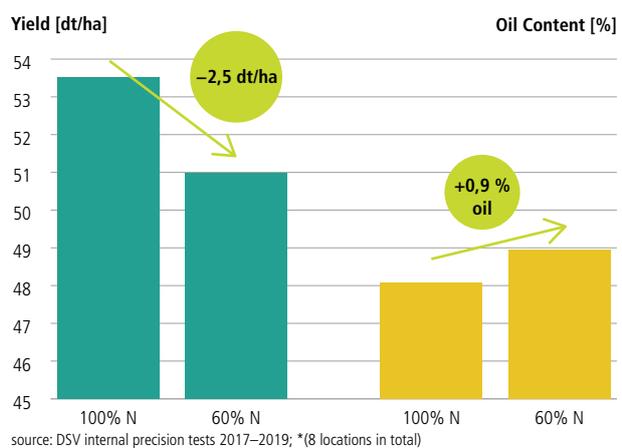
### 2. Oilseed rape produces more oil to compensate for lower nitrogen levels.

The DSV trials also showed that average annual yields fell by 0.25 t/h as a result of the 60 % fertiliser regime whereas oil contents rose by 0.7%. This means that in future it will be even more important to consider the oil content when selecting an oilseed rape variety. A 1 % higher oil level adds a premium of € 0.56 to the price of oilseed rape, so lower yields can be offset by higher oil contents. For several years now, the Poznan University in Poland has been conducting a nitrogen fertiliser trial in conjunction with RAPOOL Polski (an alliance of Polish oilseed rape breeders). Here too, even without taking account of the oil content, 120 kg N/ha was found to be the most economical nitrogen input regime, while higher levels (180 kg, 240 kg) produced only slight yield increases but were associated with higher costs. This was especially evident in years with prolonged late spring-early summer droughts when the yield potential of the oilseed rape cannot be fully exploited and the second nitrogen input comes too late to be fully effective.

### 3. The lower the yield potential of the site, the smaller the yield differences after reduced inputs of nitrogen.

Another conclusion to be drawn from the trials conducted in recent years is that lower nitrogen inputs reduced yields by just as little as 0.1 t/ha or even less on sites yielding low crop rates of less than 4.5 t/ha. However, on high-yielding sites producing over 5.0 t/ha, yields varied by more than 0.3 and in some cases by 0.4 t/ha depending on the fertiliser regime. So calculating that oilseed rape yields

FIGURE 1: RESULTS FROM THE DSV N TRIALS  
2017-2019\*



realistically 4 t/ha under the current conditions (the average yield in Germany last year was 3.3 t/ha), the nitrogen application rates for the modern varieties should range between 120 kg/ha and 140 kg/ha and still be adequate. The timing of the fertiliser application, however, is critical. With stem growth starting in mid-February, most of the entire fertiliser input should be available to the crop by mid-March at the latest. This means that fertiliser must be applied in good time when spring falls early.

To sum up, it can be concluded that nitrogen fertilisation is currently not the limiting factor in oilseed rape production. What is more important is a soil rich in nutrients and structure as well as sufficient rainfall. Then the plants can produce strong roots which are capable of drawing up water and nutrients from deeper soil horizons in dry periods. With nitrogen input levels limited, it is also necessary to think about incorporating cover crops, undersowings and legumes into the crop rotation as an additional supply of nutrients to the soil and substitute of N fertiliser.

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