



Smooth soybean sowing through talcum and graphite?

The large grain size and the high seed rate recommended for soy is pushing many single-seed drills to their performance limits. In many cases it is necessary to drive very slowly to achieve an acceptable seed pattern. Yet, the operational quality of the soybean seeding is decisive for the success of the cultivation.

In North and South America, the use of talcum and/or graphite as a seed lubricant for sowing soybeans with single-seed drills is widespread. Seed lubricants are recommended especially in sultry weather, for large grain seeds and if the grains are still moist after inoculation. We have looked into the question of whether talcum and graphite can bring an improvement in operational quality of domestic soybean seeding.



Due to the high seed rates, single-seed machines often reach their limits in soy. Can performance be improved with seed lubricants?

Quality and product knowledge

Talcum is powdered talc, a white, non-toxic magnesium silicate. It is water-repellent and very soft. Talc is mined from natural deposits in many regions of the world. The mineral is mainly used as a lubricant and release agent with low abrasive effect (cables, tyres) and is also approved as a release agent in foodstuffs.

As flow aid for sowing, common talcum is used (e.g. tyre talc). There are no special quality requirements. Talcum is particularly advantageous if the seed no longer has a smooth surface after inoculation or dressing or if the seed is clammy or sticky. It is also often used in extremely sultry conditions when the omnipresent moisture impairs the seed flow.



Talcum has numerous applications and can be purchased from the tyre trade.



The seed lubricants can be mixed by hand in the seed tank.



In addition to the seed, graphite also lubricates the moving parts of the singulation system - an advantage that is particularly useful in mechanical singulation.

Graphite also occurs frequently and is mined in natural deposits. It is a manifestation of carbon in its pure form. Like talcum, graphite is non-toxic. For example, it is used in pencils. Finely ground, graphite has excellent properties as a lubricant and is used, for example, in self-lubricating bearings. If you spill graphite powder on the floor, you can slip like on oil.

Unlike talcum, graphite only works well under dry conditions. It also improves the flowability of the seed, but primarily serves to lubricate the moving parts during mechanical singulation of the seeds.



Graphite powder from John Deere for sowing soy and corn.

With graphite, the quality of the powder is important for sowing. Accordingly, graphite with an optimum, homogeneous grain size is offered for sowing in America. The US manufacturer Kinze, for example, offers suitable graphite powder for its seed drills. In Brazil the product "Grafsolo", a pure graphite powder, is used on large areas of soy:

<http://www.grafite.com/grafsolo.php>

Often mixtures of talc and graphite are used to combine the advantages of both agents. For its perforated disc seed drills, for example, John Deere offers a mixture of 80% talc and 20% graphite:

https://www.deere.com/en_US/parts/parts_by_industry/ag/seeding/seed-lubricants/seed-lubricants.page

In North America, there are also inoculants for soy which are mixed with talcum and graphite ex works:

<https://www.abm1st.com/products/soybeans/graph-ex-for-soybeans/>

Flowrite and Flare are liquid preparations from Canada and Australia respectively, which are used for the same purpose.

Application and dosage

If it is primarily a matter of lubricating the mechanics of the machine, a little graphite is simply applied to the top of the seed when filling the seed tanks. The graphite then reaches the moving parts of the machine by itself. If, on the other hand, the seed flow is to be improved, it is sometimes worthwhile to mix in the agents evenly.

There are different indications concerning the dosage depending on the seed and dressing agent and above all on the sowing machine. In the case of talcum, moisture plays a decisive role. In very sultry weather, for example, the quantities are often increased. With graphite, the recommendations vary depending on the sowing technique and seed dressing agent used. In Brazil it is used with one to four grams per kilo of seed, depending on the seed drill and seed. For non-treated seeds, the quantity is halved. John Deere writes on his graphite containers: "With perforated disc machines,

spread 1 teaspoon per seed container over the seed. For non-disc machines (finger or brush planter) one teaspoon every fourth filling".

Pioneer makes recommendations on the use of seed lubricants for various sowing machines commonly used in the USA:

https://www.pioneer.com/growingpointlegacy/product_info/plantability_guide.pdf



Perforated disc with the note "Use graphite": In Brazil, seed technology manufacturers sometimes specify the use of graphite in order to minimise wear of the (plastic) components in the singulation system.

Talcum and graphite in test

We have investigated the question to what extent the use of seed lubricants in soybeans is advantageous under our cultivation conditions. To this end, we conducted tests on three organic farms in the 2016 growing season. Seeding was carried out with Gaspardo or Monosem perforated disc technology. For each scenario we provided seed tanks with different amounts of talcum and graphite as well as with a talcum-graphite mixture. Based on the seed monitoring and the filling level of the seed tanks, we observed to what extent the seed lubricants have an influence on the seed rate.

Unfortunately, under the given conditions we could not achieve a higher seed rate with any of the agents. One of the farms had already carried out a test with graphite in the previous year and achieved a noticeably higher seed rate. In 2015 the seeds were considerably larger than in 2016, which may explain the difference.

A positive side effect was that the seeds were immediately dry after inoculation by adding talcum powder. This meant that the otherwise necessary "drying break" before filling the seed tanks could be dispensed with.

Conclusion

Our one-year tests have not shown any significant advantage of seed lubricants for soybean seeding, although they are widely used in America. It is possible that higher driving speeds are common there, which could increase the effect of the agents. In America, sowing is often done in hot, humid weather, which might also increase the effect of the lubricants. In addition, soy seeds are treated with pesticides as standard, which considerably reduces the gliding properties of the seeds. This can also make the use of seed lubricants interesting.

Under our cultivation conditions, seed lubricants for sowing obviously do not bring the hoped-for success across the board. The use in special situations like sultry weather or large grained seeds can be interesting.

For comprehensive information on all aspects of soy cultivation visit:

www.sojafoerderring.de

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