SafeRock® MINERALS
A Natural Resource to Enrich the Earth

# SafeRock® Mineral (SRM) Impact on Wheat Growth

"The result ofa high quality crop trial speaks for itself. It is with great pleasure that SafeRock® Minerals can now release the latest results from wheat trials to the informed readership of industry leaders and businessmen, through SME World magazine."

SafeRock® Minerals has been certified for use in organic agriculture as a mineral soil conditioner. Trials to date have proven better plant growth, water infiltration and retention, increased yield, improved long term soil quality, and reduced loss of nutrients in soil. Following on from the hugely successful "SafeRock® Minerals Impact on Cotton Growth" trial seen in SME World (September 2014, Pgs 40-41) where 50% increases in cotton bolls were obtained, further field trials on wheat have now been completed with similarly impressive results.

Field trials examining the effect of SafeRock® Minerals on wheat crops were undertaken in 2014-15 in conjunction with KVK (KrishiVigyan Kendra), Sitapur (UP) a unit of ICAR (Indian Council of Agricultural Research), Ministry of Agriculture, Government of India and the Indian Agricultural Research Institute, New Delhi (IARI).

Two plots of one acre each were identified within the research farm for the trial. The soil of the experimental site was salty loam/salty clay loam, flat, well drained and mildly alkaline.The area typically ranges in temperature from 20-40°C, with rainfall between 85-140mm.

Mr Peter Senior, MRPharmS
Technical Director, SafeRock® Minerals Ltd

In November 2014 the wheat crop (Triticumaestivum L.) was sown at the KVK research farm at Katiya, Sitapur, UP under the supervision of MrManish Kumar Bisen MSc(Ag), PGDAGM at a broadcast rate of 40 kg per acre. The first one acre plot was fertilized during the growing season with 50 kg DAP (basal dose), then 50 kg Urea (1st top dressing) then another 40 kg Urea (2nd top dressing). The second plot received identical fertilizer applications except that SafeRock® Minerals was also added at a total dose of 275 kg, applied during field preparation, at the root zone and as a top dressing.

As the trial progressed, staff at the research farm commented on the observed health of the young growing wheat – tall, full and rich green in colour:-

With SafeRock® Minerals- 17/01/2015

Without SafeRock® Minerals- 17/01/2015

Soil samples were taken before and after the experiment, and tissue samples of the wheat crop were also taken and analysed by the Indian Agricultural Research Institute, and interpreted by Dr. D.S. Rana, PhD. Growth parameters such as plant height, number of plants, straw yield and grain yield were recorded from appropriate sampling areas, with threshed grains and yields reported at 12% moisture content.



Without SafeRock® Minerals- 30/01/15

With SafeRock® Minerals- 30/01/15

Plant heights of the SafeRock® Minerals wheat taken during the growing cycle, ranged from 13.5% to 25% taller than the control group (non-SRM area), and at maturity in April 2015, the crop was harvested. The yield of wheat grains from the SafeRock® Minerals area was 2570 kg compared to the control area yield of 2010 kg, a 27.9% increase in yield. Similar increases in straw yield were also seen. This alone caused much excitement within the research farm, but the soil and tissue analyses showed even more benefits of adding SafeRock® Minerals.

Soil samples taken from the two experimental plots were analysed and showed some astounding results. Use of SafeRock® Minerals resulted in higher concentrations of ALL available nutrients compared with the control plot. There was a tremendous increase in organic carbon (41%), available phosphorus (63%), copper (34%), boron (51%), calcium (62%), magnesium (111%), sulphur (28%) and sodium (42%) content over control (Table 1).

Table 1: Available nutrients status in soil after harvesting

| Parameters | Control | SRM |
|---|---|---|
| pH | 5.17 | 5.66 |
| E.C. (dS/m) | 0.28 | 0.16 |
| Organic Carbon (%) | 0.29 | 0.41 |
| Available N (kg/ha) | 179 | 188 |
| Available P (kg/ha) | 13.4 | 21.8 |
| Available K (kg/ha) | 234 | 247 |
| Available S (mg/kg) | 13.2 | 16.9 |
| Available Zn (mg/kg) | 0.79 | 0.88 |
| Available Cu (mg/kg) | 0.56 | 0.75 |
| Available Mn (mg/kg) | 5.63 | 6.57 |
| Available Fe (mg/kg) | 6.85 | 8.32 |
| Available B (mg/kg) | 0.49 | 0.74 |
| Available Mo (mg/kg) | 0.66 | 0.82 |
| Available Ca (me/100g) | 7.65 | 12.43 |
| Available Mg (me/100g) | 0.75 | 1.58 |
| Available Na (me/100g) | 0.85 | 1.21 |

These trends were also found in the plant tissue analysis. The SafeRock® Minerals wheat crop resulted in higher concentrations in ALL nutrients in grain and straw compared with the control crop (Table 2). In particular, the huge increase in Calcium and Magnesium in the wheat grains of 29% and 63%, show how efficiently SafeRock® Minerals helps plants to increase their uptake of nutrients from the soil, making more nutritious grain and straw produce.

Table 2: Effect of SRM on nutrient concentration in wheat grain and straw

| Parameters | Grain (Control) | Grain (SRM) | Straw (Control) | Straw (SRM) |
|---|---|---|---|---|
| N (%) | 2.19 | 2.31 | 0.712 | 0.756 |
| P (%) | 0.318 | 0.324 | 0.051 | 0.056 |
| K (%) | 0.279 | 0.288 | 1.512 | 1.569 |
| Zn (ppm) | 35.62 | 38.34 | 21.36 | 22.41 |
| Cu (ppm) | 10.19 | 10.38 | 15.22 | 15.63 |
| Mn (ppm) | 34.72 | 35.12 | 55.24 | 56.07 |
| Fe (ppm) | 56.87 | 62.41 | 367.2 | 412.6 |
| Ca (ppm) | 686 | 885 | 2264 | 2867 |
| Mg (ppm) | 335 | 546 | 437 | 488 |

These results show that not only does SafeRock® Minerals help to increase the yield of wheat by nearly 30%, but that it also improves the efficiency of crop nutrition ensuring more highly nutritious produce than with conventional fertilizers alone. The balanced ratio of micro nutrients and trace elements within SafeRock® Minerals ensures that the growing crop has access to every nutrient it needs for optimum utilisation of applied fertilizers and results in healthy vigorous growth.

As a long term benefit, SafeRock® Minerals remains in the soil for many seasons. Soil quality increases with repeat applications as micronutrients stimulate biota, biomass and organic matter content.

Trials at KVK Carried out by:
Manish Kumar Bisen
M.Sc (Agriculture)
Soil Science and Agri. Chemistry

The successful results of SafeRock® Minerals on the wheat crop at KVK farm, Sitapur has impressed the researchers so much, that they are currently undertaking further trials on paddy rice. Initial feedback from them is very positive and exciting, and we look forward to sharing the results in due course.

*For more details on this natural resource, visit* www.saferockminerals.com

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