

## Arsenic release in paddy soil during applying phosphate fertilizer

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### Background

Arsenic contamination has posed a serious problem in agriculture soil of South China due to mining and weathering process, Guangdong, China. Especially, The concentration of arsenic in the paddy soil near the mine area can reach 134.91 mg/kg, which is much higher than the soil safety standard. However, few study has done on the application of fertilizer on the release of arsenic during farming. Thus, the potential risk of the arsenic release should be considered during the cultivation process.

### Experiment and results

The releasing arsenic amount in the paddy soil is relevant to the pH, concentration of phosphate in the solution and ion strength, respectively during 23-day cultivation. The arsenic concentration in the soil varied with the time. Meanwhile, phosphate could affect the activity of iron, which further form iron minerals. The species of iron minerals are some amorphous iron hydroxides. Fig. 1 showed the tendency of arsenic content in the irrigating water. By extracting free iron in different depth, it was found that soil free iron increases in the cultivating process and the arsenic is more likely to exist with these minerals.

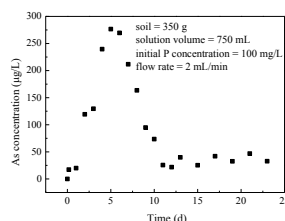


Fig. 1: arsenic variation during the irrigation process.

### Conclusion

Applying phosphate fertilizer could induce the change of iron species and arsenic release from paddy soil. Arsenic distribution might be related to the forms and amount of iron minerals. These results are useful to establish an appropriate method to avoid the most arsenic release in these areas.