August 2018

Investigation into Complaints about the Plant Response Test

Background

The plant response and weeds test (PRT) bioassay specified in PAS 100 investigates how a compost-amended growing medium (test sample) affects tomato seed germination, top-growth and plant health. The number of germinated tomato seeds in the test sample should be at least 80% compared with germination in the control, top-growth mass should be at least 80% compared with top-growth mass in the control and the test-sample plants should exhibit no abnormalities. Test samples are considered to have failed the test if germination is below 80%, plant top-growth mass is below 80% or abnormalities are observed only on test-sample tomato plants. Test sample failure is assumed to indicate that the compost exhibited phytotoxic effects. The PRT is regularly carried out by Appointed Laboratories under the Compost Certification Scheme (CCS).

Auditing

REAL carries out audits at CCS Appointed Laboratories on an annual basis. The audit includes, but is not limited to, the inspection of operating procedures, quality documents, training records, test setups and equipment, as well as worksheets for recording and calculating test results and test observations. Audit reports from 2015-2017 showed that all laboratories complied with the PRT method specified in PAS 100. The test environment is different at each appointed laboratory, however the method allows the test environment to be different as long as critical environmental control parameters can be maintained within recommended values.

The most recent audit was carried out in 2017 and four laboratories were appointed for the period of 2017 to 2018. The next audit is taking place in the second half of 2018.

Complaints and preliminary analysis

REAL received a number of complaints in 2017 regarding results from the PRT. These complaints pointed out that the number of test failures on the PRT seemed to have increased during winter.

Following the complaints Appointed Laboratories were contacted and an investigation into plant response test results was carried out by each laboratory in order to find out whether failure rates increased during certain periods and if yes, what may have caused this. Laboratories analysed their data obtained from samples tested between 2015 and early 2017 and reported that the number of failures seemed to be higher in certain months including winter months. One laboratory observed a notable peak in the number of failures in case of samples received in autumn 2016.

Further investigation and outcomes

In 2018 Appointed Laboratories were requested to send up-to-date plant response test results to REAL for further evaluation. Analysis of data from 2015-2018 showed that plant response test failures have occurred in various months and the number of failed test samples and the occurrence of failures changed depending on year and laboratory. The analysis confirmed that there was a notable peak in failures during autumn 2016 at one of the laboratories, however there was no significant increase in the number of failures in late 2017 and early 2018 at any of the laboratories. Data recorded during the past three years does not show a consistent increase in the number of plant growth failures during winter.

The number of samples failing the PRT during certain months does not provide sufficient information to make conclusions about the reliability of the test or about the reasons for test failures. Aiming to gather more insights, other PAS 100 parameters were analysed that showed that test samples failing the PRT due to plant growth had slightly different characteristics than those passing. It was found

that on average, failing samples tended to have higher electrical conductivity. It is important to note that PAS parameters do not provide a full compositional picture of the sample and thus do not provide sufficient information to be able to determine the exact reasons for PRT failures.

Moving forward

- Development of the CCS database to include extraction of laboratory results from PAS100 reports. This will allow REAL to capture and monitor trends in test results.
- Introducing complaint forms and official procedures for submitting complaints to be able to collect written evidence from producers.
- Development of a proficiency testing scheme for non-standard methods specified in the PAS 100 such as Stability, Physical Contaminants and Plant Response Test. Once ready, the PT Scheme will help monitor the reliability of test results obtained from these tests.
- Development of the Research Hub to provide a mechanism for funding research projects that aim to improve various aspects around the production of quality compost and certification, for the benefit of scheme participants and the composting industry. The Hub will provide the necessary framework for projects such as test method revision and development, or assessing the suitability of alternative test methods. The Hub was launched in spring 2018.

For further information about ongoing projects please get in touch: info@realschemes.org.uk