JAPANESE KNOTWEED CONTROL EXPERIMENT

Report of Initial Results of the Japanese Knotweed Trial conducted by Kevin Moore.

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Project commissioned by Inishowen Rivers Trust & Funded by Donegal County Council

INTRODUCTION

Through the making and application of a full spectrum of active beneficial native Bacteria, Fungi, micro and macro-Arthropods designed to enable a higher level of plant succession, it is envisaged that the soil structure, chemistry, and subsequent pH level change would produce a soil medium no longer favourable, or indeed capable of the continued growth of *Fallopia japonica*. A previous trial carried out by Dr. Elaine Ingham at the Soil Food Web School in Corvallis, Washington, US was shown to be successful, and so it was the aim to run a similar trial here in Inishowen, and gather relevant data.

SITE ASSESSMENT

At Riversdale House, Carndonagh with the kind permission of the landowner, Wilson Moore, the trial was started in June 2021 with a site assessment. Three areas of Japanese Knotweed were chosen (Plots A, B & C (control)) along a stretch of the Glennagannon River. The plots were of a similar size with a similar amount of stem bodies present, and the area had good accessibility for the application.

All plants were in full summer bloom and showed no signs of discolouration or leaf damage. All flower heads showed abundant and diverse insect activity including bumblebees, honeybees, multiple hoverfly species and beetles.

Soil samples were taken from each plot, from the base of sample plants as well as from around the drip line. It was noted that these soil samples had low organic material depth (25mm) and below this a layer of sand and silty material (sample taken to 40mm) indicating a bacterial dominated soil.

A 10m wide distinct boundary and a ford across the river separated Plots A & B clearly. The control Plot C was also separated by the track to a 2nd ford.

MICROBIAL COMPOST PRODUCTION

8TH SEPTEMBER 2021

Material gathering -Found on site, within the catchment or locally obtained.

01

WOODY MATERIAL

Fresh Alder, Oak, Birch thinning - chipped. Cardboard. Coffee Grinds

02

GREEN MATERIAL

Lawn clippings, weedy material

03

HIGH NITROGEN

Horse manure, Alpaca Manure

04

INOCULUM

Locally grown microbes - high fungal & beneficial Bacteria

MIXING THE MATERIALS

The materials are mixed in a specific recipe to aim for a 2:0 ratio or higher of fungi to bacteria. The whole process follows the protocol laid out by the Soil Food Web School and Dr. Elaine Ingham.

The ratios of materials were measured out using buckets, with the drier material being soaked in ambient temperature water and then strained out.

The heap was then made in layers. 2 different methods were used. One batch was made in an upright cage and the other in a horizontal windrow. The compost piles were covered with tarpaulin to prevent being saturated with rain, dried out in wind and cooled too much.

MONITORING THE COMPOST

Once the compost pile had been built, it had to be continually monitored to ensure that it reached the required temperature for the correct amount of time. This involved taking the temperature using a long probe thermometer several times a day and recording the data. The compost was then turned using a specific technique and the process repeated again.

With the medium ready, it was then assessed under the microscope to ensure that a diverse enough range of beneficial microbes were present in sufficient numbers and in the desired ratio of fungi to bacteria.

APPLYING MICROBIAL COMPOST

SEPTEMBER 12TH 2021

PLOT A

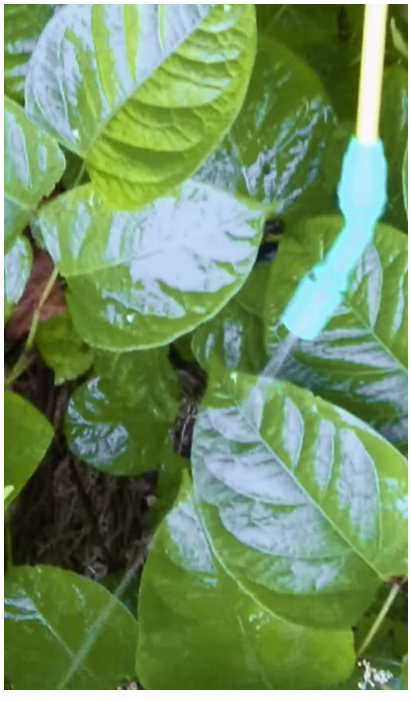
Microbe rich compost (Bio Amendment) was added to the base of the Japanese Knotweed plants by hand 1/2 inch thick which is a rate of one tonne per acre.

PLOT B

Bio Amendment was added to the base of the Japanese Knotweed plants and a microbe-rich water extract of the compost was made and used as a foliar spray covering a minimum of 70% of the plants.

PLOT C

This patch was the control and so received neither bio amendments nor foliar spray.



INITIAL RESULTS

SEPTEMBER 24TH 2021

A

MICROBE COMPOST ONLY

B

MICROBE COMPOST & FOLIAR SPRAY

C

CONTROL: NO TREATMENT

12 days post treatment, both Plots A & B showed signs of stress whilst Plot C was still perfectly healthy.

Plots A & B had a large number of leaves showing fungal spots and decay, and Plot B also had several areas of fungi/fruiting bodies growing at the decaying stem bases.

FURTHER RESULTS

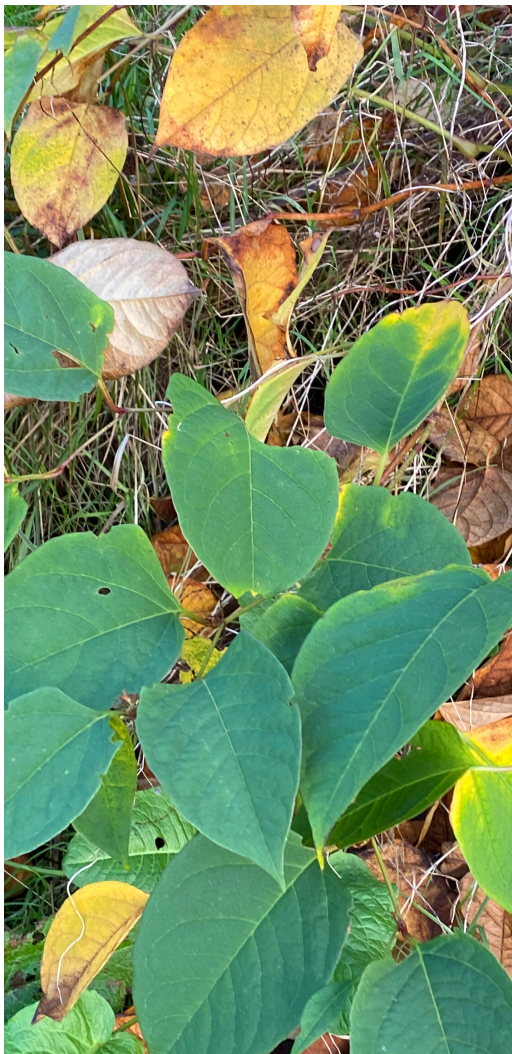
OCTOBER 11TH 2021

Continued monitoring of the site showed further decay, although due to the time of year, with the Japanese Knotweed starting to breakdown naturally, it was difficult to assess what was natural decay and what was induced by the treatment.

A

B

C



CONCLUSION

The results certainly seemed very promising with an increased rate of decay on Plots A & B compared with the Control Plot C. The emergence of fruiting bodies in Plot B was a very encouraging sign. Further experiments are needed to improve the compost medium production and control environmental variables.

Soil analysis of the site before and after the experiement showed an improvement in the fungi: bacteria ratio, making the soil suitable for understory shrubs, e.g a higher plant succession. Ideally the site would need to be planted with such understory plants in order to feed the fungal soil and avoid a return to bacteria dominated soils.

WHAT WE CAN DO BETTER

Data collection, such as recording temperatures needs to be done at more consistent intervals. More animal manure was needed and some of the material was not cut fine enough due to lack of time and access to equipment on site.

An indoor production space would also have been more ideal.

Future trials would:

- consider the environmental variables more thoroughly
- improve on data collection
- secure more reliable sources of material.
- obtain suitable equipment to gather and prepare the materials.