

Growth performance of black soldier fly larvae on high fibrous residual streams pretreated by composting and fungi

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Clippings in the Netherlands



≈ 500,000 ton
annually



Reed
175,000 tons wet



Grass
100,000 tons wet



Waterweed
20,000 tons wet



Pennywort
10,000 tons wet



Pond herb
10,000 tons wet

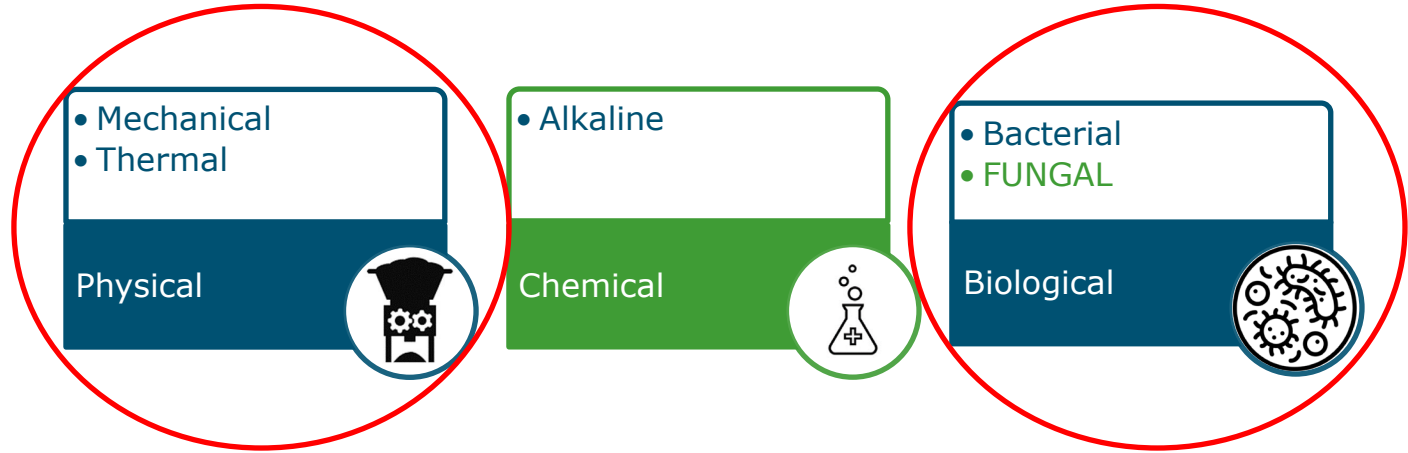


Duckweed
7,500 tons wet



Japanese Knotweed
1,000 tons wet

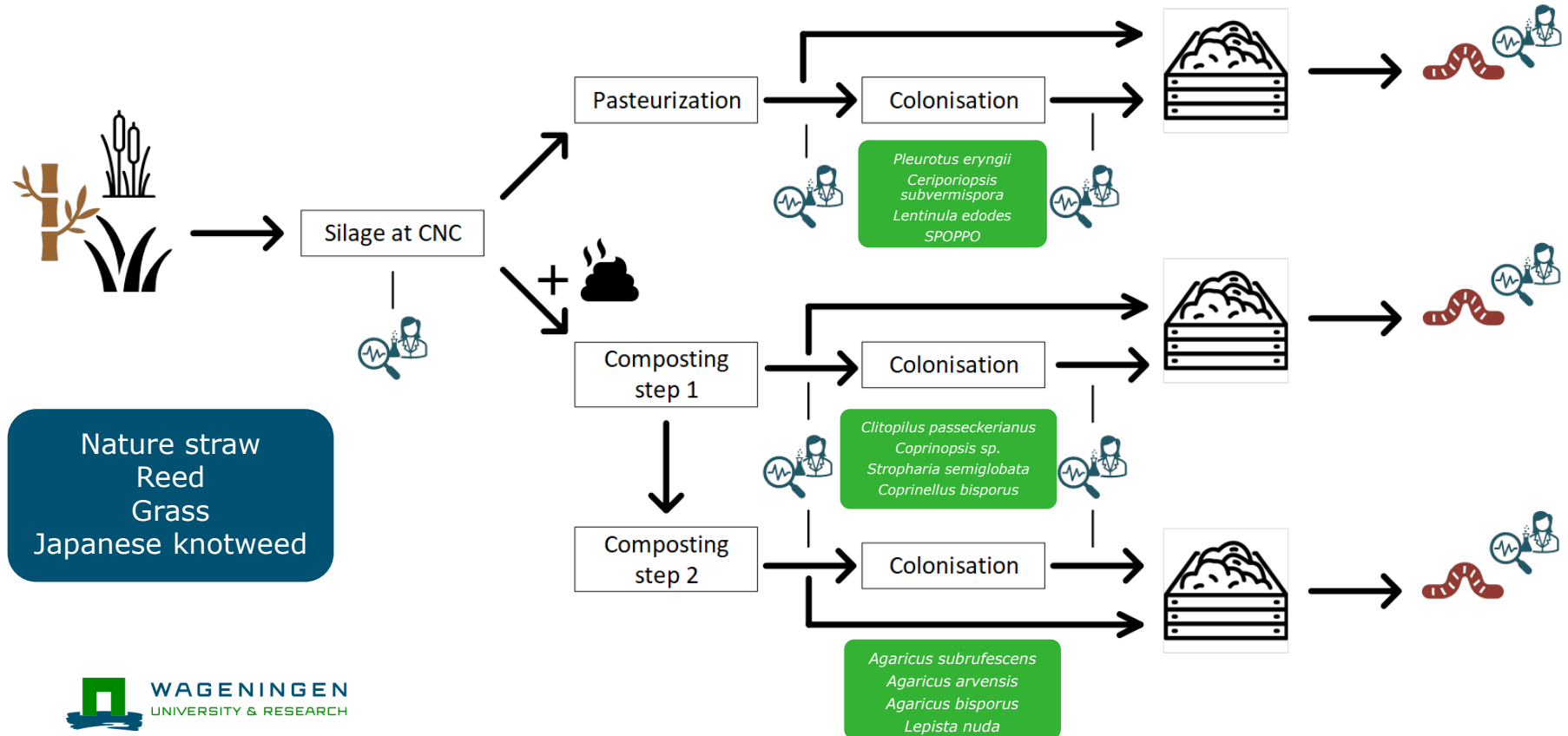
CoMySect project



CoMySect project

Develop **safe** and **nutritious** substrates for insect rearing from **low-value** organic residual streams using **composting**, **fermentation** and **mycoremediation**

Overview



Screening pilot



Methodology screening pilot at WUR



Reed



Japanese Knotweed



Naturestraw



Grass



44 treatments
n = 1

Starting point:

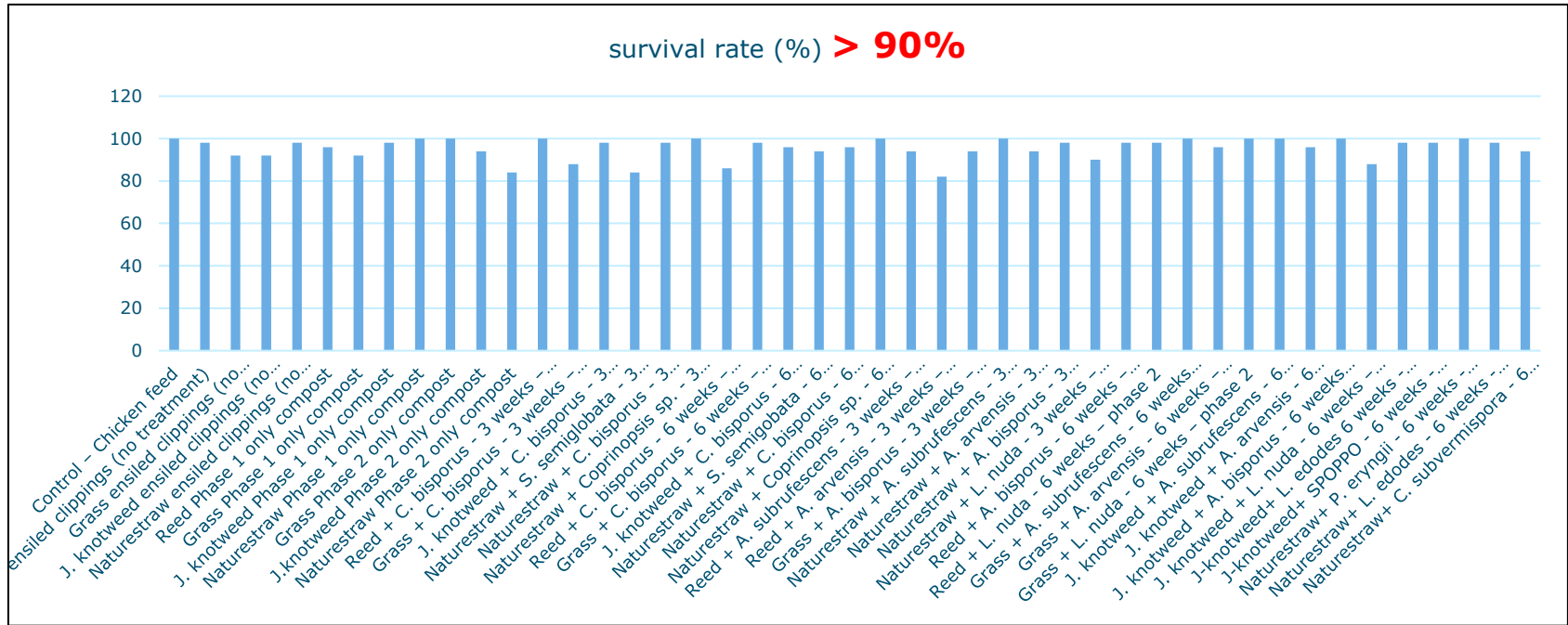
- 50 larvae (5 days old)
- 25 g substrate (0.5g/larvae)
- Larval weight

↓
1 week

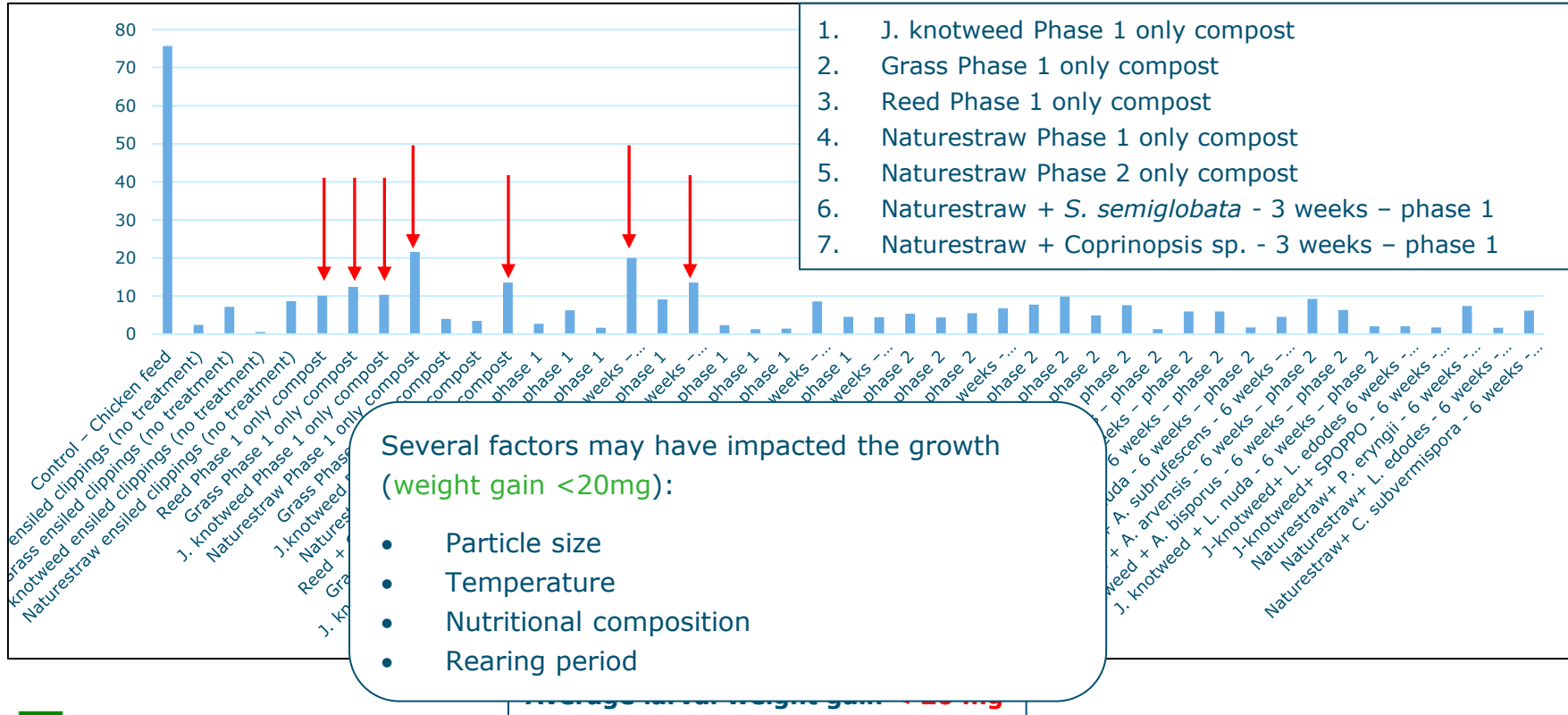
Harvesting point:

- Counting alive larvae → survival rate
- Larval weight (yield)
- Frass weight

Results – survival rate (%)



Results – average larval weight gain (mg)

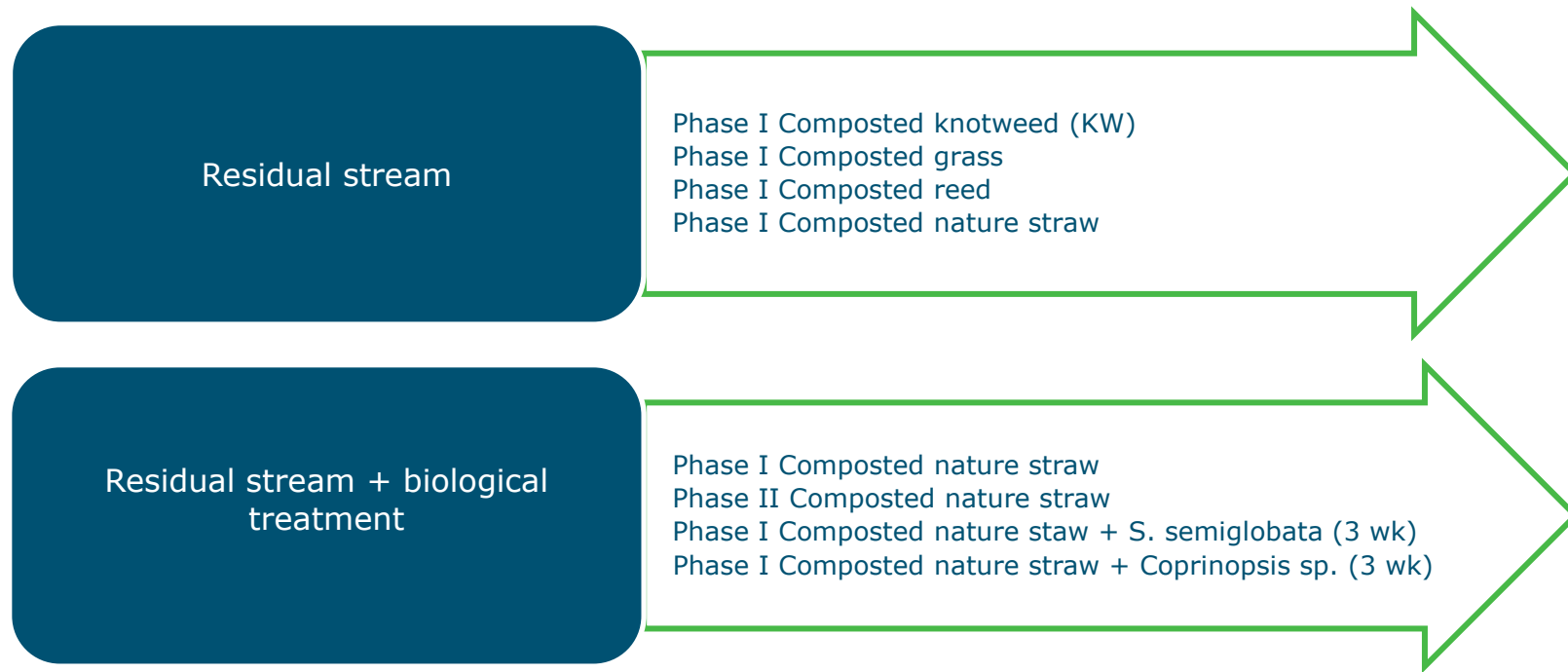


Small scale experiment at Protix

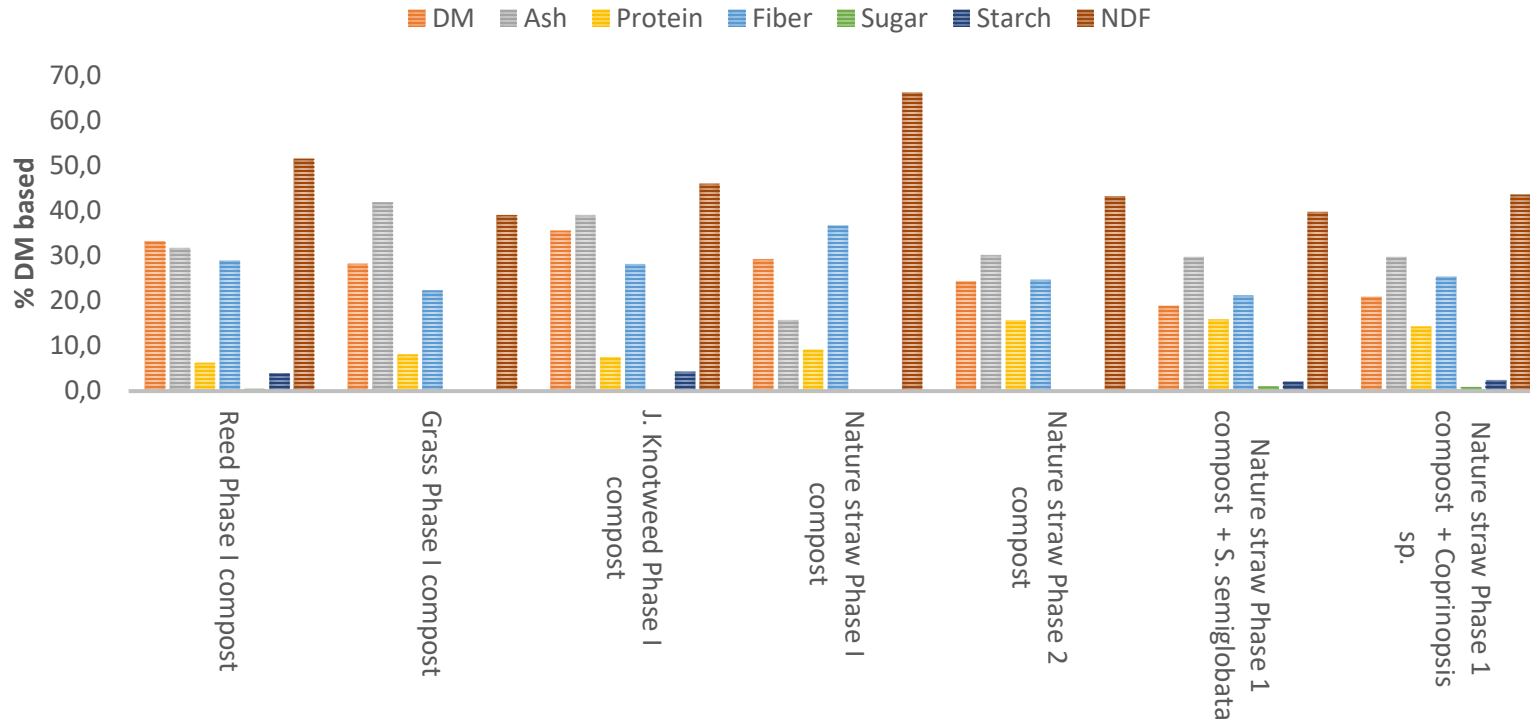




Materials & Methods – small scale experiment at Protix



Chemical composition residual streams





Methodology- small scale experiment at Protix



Naturestraw



Japanese Knotweed



Starting point:

- 200 larvae (5 days old)
- 100 g substrate (0.5 g/larvae)
- Starting temperature 39 °C
- Adding water when dehydrated

6 days



Harvesting point:

- Counting alive larvae → survival rate
- Larval weight (yield), weight gain
- Dry matter larvae
- Feed conversion ratio



Reed

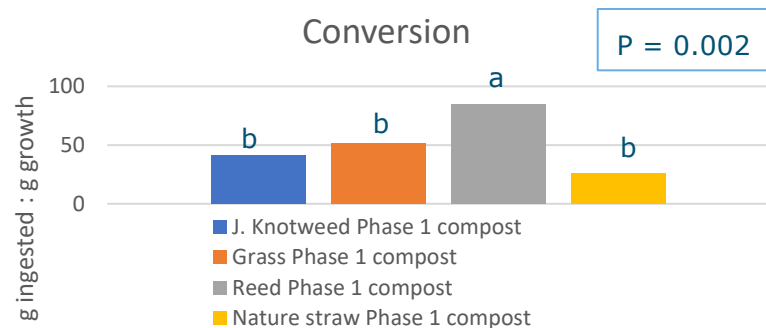
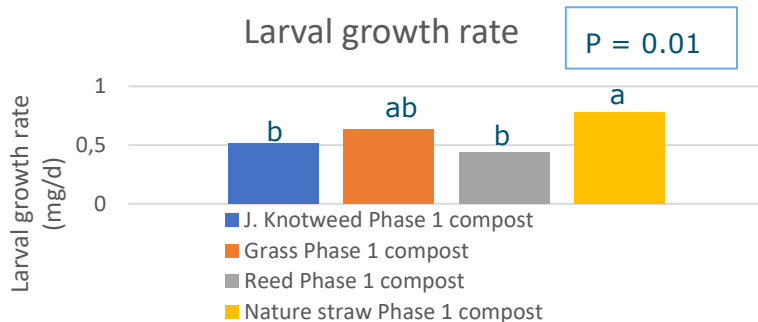
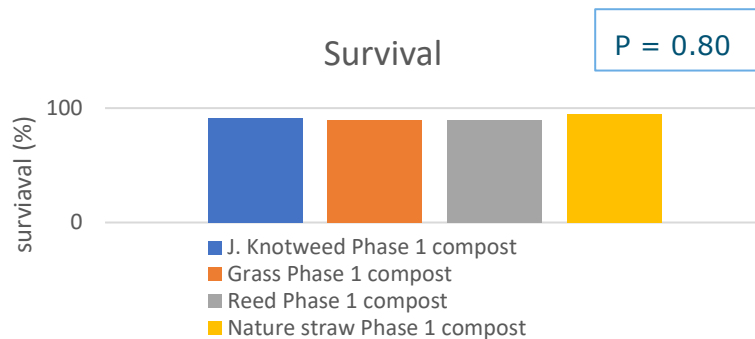


Grass





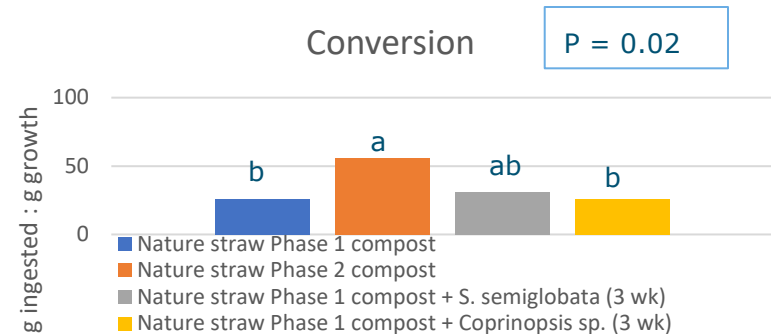
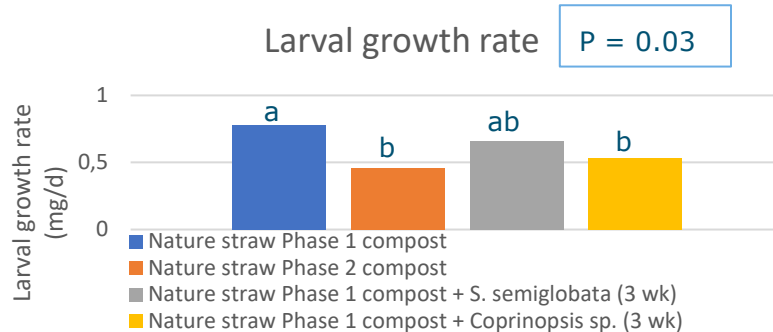
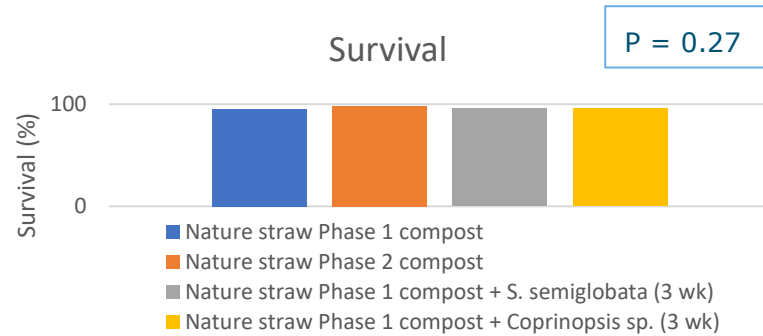
Results – Residual streams



Nature straw Phase 1 compost resulted in highest larval growth rate and most efficient conversion



Results – Biological treatments



Nature straw Phase 1 compost and Nature straw Phase 1 compost+ *Coprinopsis* sp. - 3 weeks resulted in the most efficient conversion

Summary and next steps

- Nature straw Phase 1 compost resulted in highest yield
- Nature straw Phase 1 compost and Nature straw + *Coprinopsis* sp. - 3 weeks – phase 1 resulted in the most efficient conversion
- No direct correlation between observed results and the low nutritional profile of residual streams
- Next step:
 - Residual streams as a structure ingredient in substrates \ possible stimulating effects on the growth performance of black soldier fly larvae

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