

LATVIA UNIVERSITY OF AGRICULTURE

DATASHEET

**THE IMPACT OF VERMIEXTRACT ON PLANT GROWTH IN THE
VEGETATION EXPERIMENTS**

**on the progress made according to the contract:
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CONFIRMATION

for atypical fertilizer, plant growth promoter or microbiological preparation
compliance to Regulations of the Latvia Cabinet of Ministers „Fertiliser
identification, quality, conformity assessment and trade rules requirements”

Fertilizer name:	„VERMIEXTRACT”
Fertilizer manufacturer: (name, address)	SIA “Verners un draugi” Ausekļa iela 7, Alūksne, Alūksnes novads, LV-4301
Scientific institution, who carried out the fertilizer efficiency test (name, address)	Latvia University of Agriculture, Lielā iela 2, Jelgava, LV-3001 Latvia
Place of experiments (name, address)	Faculty of Agriculture, Institute of Soil and Plant Sciences, Department of Plant Biology, Strazdu iela 1, Jelgava, LV3004

The experiments were carried out during vegetation period in 2014 and 2015.

Trials included:

- 1) Evaluation of “Vermiextract” activity with seed-based bioassays (germination and radicle growth assessment);
- 2) Assessment of plant of “Vermiextract” activity with seed-based bioassays (germination and radicle growth assessment);

1. Plants used in seed germination biotests:

Cucumber (*Cucumis sativum* L.);
Tomatoe (*Lycopersicon esculentum* Mill.);
Oat (*Avena sativa* L.);
Spring wheat (*Triticum sp.*);
Garden cress (*Lepidium sativum* L.).

Seeds were germinated on filter paper in Petri plates. Bioassays were performed in three replicates. Each Petri dish was filled with 10 ml of the solution with a concentration of 10%, 1%, 0.1%, 0.01%, 0.001% or 0.0001% respectively. Seeds incubated in the tap water were used as control. Petri plates with seeds were incubated in the dark (22° C) for 7 days.

The results are reported in table 1.

Table 1

The effect of preparation “VERMIEXTRACT” on seed primary root growth
(% compared to the control)

Conc. mL L⁻¹	wheat	oat	tomatoes	cucumbers	cress
100	7.9	-1.2	-10.5	-35.4	-59.1
10	-3.4	21.2	49.8	-19.9	-7.5
1	11.9	36.9	77.4	-26.9	8.4
0.1	6.4	5.2	35.9	9.9	1.4
0.01	11.9	13.3	89.1	-21.5	7.2
0.001	11.1	-0.3	68.0	-27.8	16.3

The results showed that different crops varied in sensitivity. However, on average the most appropriate concentrations were in the range from 0.1 to 0.01%.

2. THE IMPACT OF VERMIEXTRACT ON PLANT GROWTH IN THE VEGETATION EXPERIMENTS

The vegetation experiments in the 2014 were carried out with:

- 1) Garden cress (*Lepidium sativum* L.);
- 2) Spring wheat (*Triticum* sp.);
- 3) Cucumber (*Cucumis sativum* L.)

The vegetation experiments in the 2015 were carried out with:

- 1) Cucumber (*Cucumis sativum* L.);
- 2) Tomatoes (*Lycopersicon esculentum* Mill.);
- 3) Beetroot (*Beta vulgaris* L.)

Cucumbers were grown in the 10 L vegetation pots filled with peat substrate (KKS-U (pH 5.9, PG Mix 15-10-20), but tomatoes and beetroot were grown in the field in loamy soil (pH 7.50, N- 50, P-512, K-130, Ca-12700, Mg-3105, EC mS/cm 1.38).

Plants were treated with “VERMIEXTRACT” solution three times during vegetation period. All experiments were done in three replications.

Table 2**The effect of preparation “VERMIEXTRACT” on plant yield**

Crop	Year	Used concentration, mL L ⁻¹	Yield increase compared to the control (%), trial that respects the only difference principle
Cress (<i>Lepidium sativum</i> L.)	2014	1	-2.1
		0.1	19.7
		0.01	3.0
Spring wheat (<i>Triticum sp.</i>)	2014	1	8.3
		0.1	8.9
		0.01	4.8
Cucumber (<i>Cucumis sativum</i> L.)	2014	1	-3.6
		0.1	51.7
		0.01	30.2

Table 3**The effect of preparation “VERMIEXTRACT” on plant yield in 2015**

Crop	Year	Used concentration, mL L ⁻¹	Yield increase compared to the control (%), trial that respects the only difference principle
Cucumber	2015	0,1	3.7
		1	5.8
		10	10.6
Beetroot (influence on root formation)	2015	1	11.7
		10	-1.5
Beetroot (influence on leaves)	2015	1	23,5
		10	-8.4
Tomatoes	2015	10	24.9
		100	20.8

Table 4**Summary table of „Vermiextret” effect on plant growth**

Plant	Year	Concentration, mL L ⁻¹				
		100	10	1	0,1	0,01
Cucumber	2014	-	-	0	+1	+1
	2015	-	+1	0	0	0
Tomatoes	2015	+1	+1	-	-	-
Beetroot	2015	-	0	+1	-	-
Spring wheat	2014	-	-	0	0	0
Cress	2014	-	-	0	+1	0
Explanations		-	Experiment did not occur			
		0	No significant influence			
		+1	Significant positive influence			
		-1	Significant negative influence			

Conclusions

1. Humic substance preparation "Vermiextract" is recommended for vegetable cultivation.
2. Most applicable concentrations depend on the crop.
3. Recommended "Vermiextract" concentrations are in the range from 0.1 to 10 ml L⁻¹ (0.01-1% solution).
4. Studied "Vermiextract" concentrations have no significant negative impact on the plant growth and yield within the experiments.