

***REPORT OF POT CULTURE TRIALS
ON
EFFECT OF APPLYING MICROSOIL™***

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APRIL 15TH, 1997**

Objectivity of the Experiment

The pot trials on Microsoil™ is to determine its effect on crops yield increment and its impact on soil environment.

Material and Methods

The experiment chose four soils at different fertility levels from Tianjin suburbs and rural areas to conduct pot culture trials in greenhouse of Tianjin Academy of Agricultural Sciences.

Tested Soil:

- 1 Developed vegetable soils in Zhongbeixie, Xiqing District
- 2 High-yielded staple crop soils in Zhangjiawo, Xiqing district
- 3 Low-yielded staple crop soils in Qingguang, Xiqing District
- 4 Sandy soils in Jinghai Development zone

Tested Crops: Rape Variety: Wuyueman

Treatment:

- 1 CK
- 2 Microsoil™ 2ml(having diluted by 50 times)
- 3 Microsoil™ 10ml(having diluted by 50 times)

In order to observe the effect of applying Microsoil™ on crops directly and effectively, any other fertilizers are not applied. Three replications for each treatment were arranged. The plastic pots with a diameter of 20cm is used to accommodate 2Kg soils each. The pretreated soils were loaded in the pots with a pre-irrigation of 300 ml water on March 7th and 25 rape seeds for each pot were planted on March 10th to observe the emergence. The soil samples were taken every ten days to analyze soil PH, soil organic contents, total N, readily available nitrogen, phosphorous, potassium and cation exchange capacity(CEC).

The early-term results of pot trials

A. Effect of applying Microsoil™ on germination rate of rape seeds

Three surveys on emergence rate were conducted on March 17th, March 21st and March 27th respectively and the data were listed in Table-1. From the results listed we could see the mobile process of seedling emergence rate in different treatments. The uniformity of emergence rate of rape seeds varied with different soil conditions. The developed vegetable soils appeared earlier and uniformity of emergence. The sandy soil in Qingguang shows the earlier and uniformity of emergence while the soil texture in Zhangjiawo is clay so its emergence was slower. The soil texture in Jinghai is sandy clay with fairly low fertility may be responsible for its later emergence and retarded growth. The different treatments showed great variation in this four tested soils. From the results obtained from three surveys, the general trend demonstrated that the emergence rate with Microsoil™ treatment is higher than that of control treatments and it can effectively promote earlier emergence. The treatment of Microsoil™ 10ml in developed vegetable soils in Zhongbeixie appeared the faster and most even emergence and the highest emergence rate compared to the other three soils. The treatment of 2ml Microsoil™ also showed same trend. The treatment of Microsoil 2ml has the best effect on seeds emergence although the treatment of Microsoil 10ml could promote emergence. It's concluded that the over application of Microsoil™ can inhibit seedling emergence and growth of rape due to relative high buffering capacity in high fertility soils

and low buffering capacity in soils with low fertility.

Table 1 Effect of Applying Microsoil™ on Emergence Rate

Time of Survey	treatment	Zhongbeixie		Zhangjiawo		Qingguang		Jinghai	
		AE	ER	AE	ER	AE	ER	AE	ER
Mar,17th	CK	20.3	81.3	7.66	30.6	21.3	85.3	3.00	12.0
	2ml	21.0	84.0	15.0	60.0	22.7	90.7	13.0	52.0
	10ml	23.0	92.0	9.67	38.7	17.3	69.3	12.7	50.7
Mar.21st	CK	22.0	88.0	12.7	50.7	21.7	86.7	19.3	77.3
	2ml	22.7	90.7	18.0	72.0	22.7	90.7	21.3	85.3
	10ml	23.7	94.7	12.3	49.3	19.0	72.0	19.7	78.8
Mar.27th	CK	22.3	89.3	13.3	57.3	22.7	90.7	18.7	74.7
	2ml	23.0	92.0	19.7	78.7	23.3	93.3	21.0	84.0
	10ml	23.3	93.3	15.3	61.3	19.0	72.0	19.7	78.7

Note: AE-amount of emerged seedlings ER-rate of seedling emergence

B.Effect of Applying Microsoil™ on PLant Height

From the results of measuring plants height on April 10th, which was listed in Table-2, we can conclude that the plants' height of rape closely correlated with soil fertility levels. The mean plant height in developed vegetable soils with high fertility level was 12.7 centimeters while in high-yielded staple crop soils, 11.7cm, in low-yielded staple crop soils, 8.2cm, in low fertilized sandy soils, just 3.4 cm. All of the two treatments which applied Microsoil™ in four tested soils appeared obvious plants' height increment trend with different levels. The increment ranged from 7.4%-27.6%, of which the treatment which applied 2ml was 17.7%-27.6% and the treatment of 10ml was 7.4%-20.7%. On the basis of above results, we easily make conclusion that 2ml treatment appeared better plants' height promotion effect in all tested soils.

Table-2 Effect of Applying Microsoil™ on Plants Height

Treatment	Zhongbeixie		Zhangjiawo		Qingguang		Jinghai	
	(CM)	%	(CM)	%	(CM)	%	(CM)	%
CK	11.6	100	10.8	100	7.7	100	2.9	100
2ml	14.0	120.7	12.8	118.5	8.6	117.7	3.7	127.6
10ml	12.5	107.8	11.6	107.4	8.3	107.8	3.5	120.7
mean	12.7		11.7		8.2		3.4	

C. Description of Plant Growth Status

The growth status of rape is mainly determined by soil fertility level from results gotten by one-month observation and analysis in its development. The earlier and more uniform seedling emergence in soils with high fertility levels will play a critical role in obtaining higher yield at harvesting time while in soils with low fertility levels its later and less uniform seedling emergence must have negative effect on its lower output. The application of Microsoil™ could significantly promote earlier and higher rate of seedling emergence, especially in low fertilized soils. As far as plants height concerned, it can obviously promote the growth and height of plants. Based on growth status of rape, applying 2ml Microsoil™ had the most ideal effect.

D. Effect of Applying Microsoil on Soil Physical and Chemical Properties.

The soil samples taken from different treatments are being under analysis in laboratory. The results of soil analysis will be submitted upon termination of analysis. But the soil with applying Microsoil™ has better soil structure than that of non-application.

Summary

From the results achieved in the first-phased pot trials on rape, it can be concluded that application of Microsoil™ could apparently promote earlier seedling emergence, improve the uniformity of germination and increase emergence rate while simultaneously promote plants height increment ranging from 7.4% to 27.6%. The most ideal and proper applying quantity is 2ml and the effect of applying it on yield will be discussed in subsequent reports.

Accessory Report
on
Experiment Arrangement for Microsoil™ Field Trials
in Tianjin Areas

1. The pot culture trials has been proceeded for one month and the first-phased report has been submitted by us.

2. Field Trial for Vegetable Crops

2-1. Fruit Vegetables:

The green pepper experiment has been located in Shuigaozhuang Experimental Station in Xiqing District. The spray of Microsoil™ has been conducted on Mar. 31st and on April 1st the pepper has been planted.

2-2. Leaf Vegetables:

The cabbage experiment has been arranged in Liqizhuang, Xiqing District on Mar. 2nd and the cabbage has been planted on Mar. 29th.

2-3. Shoot Vegetables:

The celery experiment has been located in Xinzhuang, Jinnan District. Due to the problems of its growing season, the celery has been planted in November, 1996 and on Mar. 18th it has been sprayed with Microsoil™.

3. Field Trials for Grain Crops

3-1. Winter Wheat:

The experiment was arranged in Wangzhuang, Jinghai and due to the growth season of winter wheat it has been sprayed with Microsoil™ which has been diluted by 100 times on Mar. 25th.

3-2. Rice:

The experiment will be initiated in May, 1997.

Tianjin Soil and Fertilizer Institute
April 15th, 1997

