

# **Experiment for micro-organisms effect on growth and disease prevention of Cucumber**

## **1. Experiment purpose**

Through field comparison experiment, test the effect of micro-organisms on growth and antagonism of cucumber.

## **2. Experiment material and method**

2.1 Indication crop: variety “Bonai 13” of cucumber

2.2 indication agents: B2, B9, Y2, FZB42, FZB24, FZB42M.

2.3 Experiment place and condition:

Vegetable base of Yongning County in Ningxia province was arranged. The greenhouse with flat hypsography, identical soil property and middle fertility was selected. Transplant was done on March 20, 2010.

### **2.4 Plot design:**

Seven treatments containing B2, B9, Y2, FZB42, FZB24, FZB42M and water control were designed. There were 3 ridges for each treatment as three repeats. There was a ridge between two treatments. Total was 44 ridges. It was designed first 4 ridges as guard rows on the fringe of the field.

### **2.5 Operation method**

First whole tree spraying was carried on at the flowering stage. Micro-organisms were diluted to 500 times. When it dribbled, spraying was stopped. No spraying for CK. After first spaying, spraying had been done for every 20 days.

### **2.6 Investigation method**

2.6.1 Promotion of bio-agents

Growth period: it was investigated once before every spraying. Investigation index was determined by crop growth.

The left line of every ridge was surveyed. After first three plants, plant height, leaf quantity, fruit quantity and disease incidence of continued five plants were record.

Harvest time: plants and fruits weight of each repeat were record particularly.

## 2.6.2 Disease investigation:

Disease classification standards:

Grade 0: no disease spot;

Grade 1: disease spot area is 1-20% of leaf area;

Grade 2: disease spot area is 21-40% of leaf area;

Grade 3: disease spot area is 41-60% of leaf area;

Grade 4: disease spot area is 61-80% of leaf area;

Grade 5: disease spot area is more than 81% of leaf area

## 3. Spraying date

Spraying was done on April 14, May 4 and May 27, respectively.

## 4. Result and analysis

### 4.1 Effect on promotion and disease prevention

On May 6, promotion and antagonism were investigated after a 20 days interval away from the first spaying. Plant height, leaf quantity and disease leaves quantity of each treatment with 15 plants were record.

**Table 1 effect of micro-organisms on growth promotion**

Treatment	Height (cm)	increased (%)	Leaf quantity for each plant (leaf)	increased (%)
B2	182.40	-8.06	20.40	0.66
B9	188.60	-4.94	21.07	3.95
Y2	195.47	-1.48	20.53	1.32
FZB42	200.33	0.97	21.73	7.24
FZB24	190.53	-3.97	20.53	1.32
FZB42M	196.00	-1.21	19.73	-2.63
CK	198.40	----	20.27	----

It showed from table 1 that, there were no significant differences among different treatments. It was analyzed that there were no significant differences compared with CK.

**Table 2 effect of micro-organism antagonism on frost mildew disease of cucumber**

Treatment	Leaf quantity investigated	Disease leaf quantity	Disease incidence (%)	Control efficiency (%)
B2	306	74	24.58 d	60.07
B9	316	163	51.47 c	16.40
Y2	308	180	58.02 abc	5.76
FZB42	326	220	67.43 a	-9.53
FZB24	308	187	60.61 abc	1.55
FZB42M	296	163	55.11 bc	10.49
CK	304	187	61.56 abc	----

Table 2 showed that, It was investigated that disease incidence of treatment B2 showing a significant difference from others, was obviously decreased 60.07% comparing to CK. While, there were no remarkable differences among other treatments.



After the second spaying with different micro-organisms, on May 27, death plants due to blight disease (a root disease) and leaf due to frost mildew (a leaf disease) were investigated, and staggered yield also was compared.

**Table 3 effect of bio-agents controlling frost mildew disease of cucumber**

treatment	Leaf quantity investigated	Disease leaf quantity	Disease incidence (%)	Disease index	Control effect (%)
B2	230	202	87.94	26.37 d	46.71
B9	238	225	94.59	45.32 ab	8.41
Y2	224	209	93.120	46.80 a	5.43
FZB42	234	211	90.15	49.16 a	0.65
FZB24	241	216	89.60	44.91 ab	9.24
FZB42M	244	221	90.53	40.25 abc	18.65
CK	234	219	93.65	49.48 a	----

Table 3 showed that, It was investigated that disease incidence of treatment B2 showing a significant difference from others, was obviously decreased 46.71% comparing to CK. While, there was no significant difference among other treatments.

**Table 4 effect of bio-agent against to blight disease of cucumber**

Treatment	Total plants	Death plant	Seedling emergence (%)	Control effect (%)
B2	120	13	10.70 B	76.46
B9	115	6	5.22 B	88.52
Y2	118	6	5.18 B	88.61
FZB42	115	17	14.54 B	68.00
FZB24	117	56	47.43 AB	-4.39
FZB42M	116	15	12.68 B	72.11
CK	115	52	45.44 A	----

It showed in table 4 that, for anti-disease variety “Bonai 13”, dead seedling of B2, B9, Y2, FZB42 and FZB42M reduced 68-88.61% comparing to CK. And all bio-agents were analyzed extremely significant differences compared with CK.



#### 4.2 Investigation for yield on harvest time

**Table 5 effect of bio-agents on yield increase**

Treatment	yield (Kg)	increased (%)
B2	57.47 ab	-2.16
B9	63.17 ab	7.55
Y2	65.67 a	11.80
FZB42	61.33 ab	4.43
FZB24	52.8 bcd	-10.10
FZB42M	45.27 cde	-22.93
CK	58.73 ab	----

Cucumber yield of different treatments with same area were record when they were plucked from April 18 to May 26.

It could be seen in table 5 that, all micro-agents contributed to yield increase was not remarkable.