



**MINISTRY OF AGRICULTURE
ZAMBIA AGRICULTURE RESEARCH INSTITUTE**

Report on the effectiveness of MICROBEBIO X6 Bio-pesticide
against the fall armyworm in wheat.

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INTRODUCTION

MICROBEBIO X6 is a biological/botanical insecticide marketed by MICROBEBIO INC. United States of America. It contains *Beauveria bassiana*, Alkyloxypoly-ethylenoxyethanol and Pyrethrins. Chemical description: mixture of substances in liquid formulation. It's meant for the control of insect pests such as bollworms, armyworms and other moths.

Objective:

To test for the effectiveness of MICROBEBIO X6 Bio-pesticide liquid formulation against the fall armyworm larval pest attacking wheat.

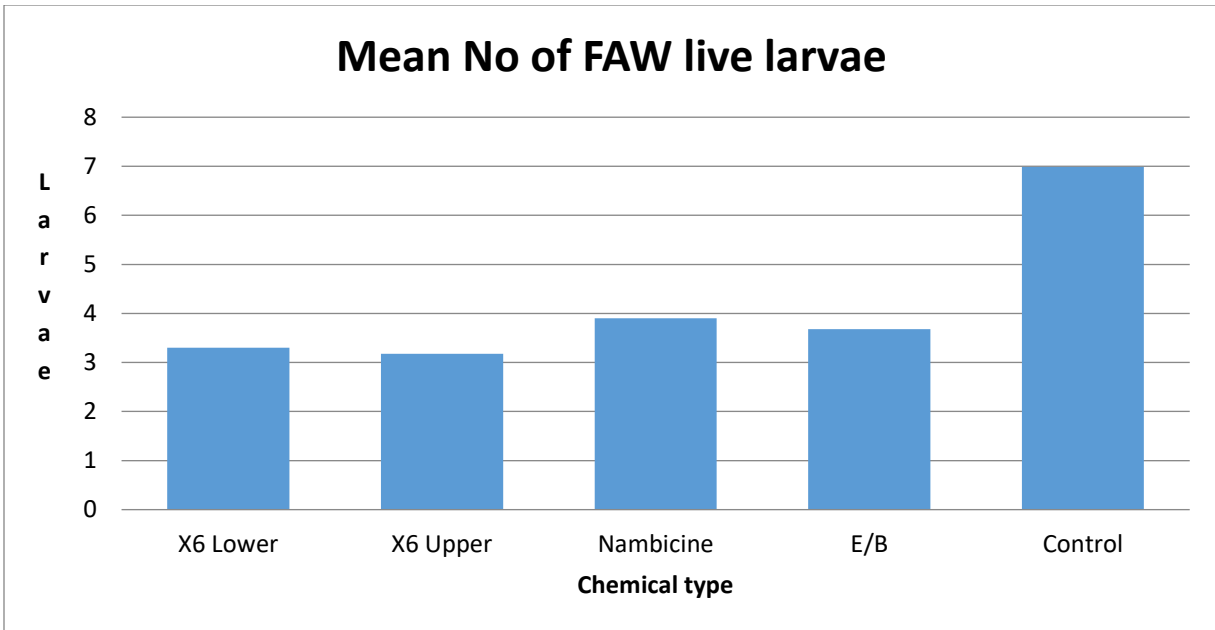
EVALUATION METHOD FOR MICROBEBIO X6 FOR ARMYWORMS' CONTROL

MICROBEBIO X6 was being tested for effectiveness together with two (2) other test pesticides; **Emamectin benzoate and Nimbecidine**, from the Zambia National Service (ZNS) Airport farm's wheat field. The trial was conducted in the wheat fields where populations of fall armyworm caterpillars (larvae), were seen to be feeding and growing rapidly. All the Treatments were replicated four (4) times and all the replicates were sprayed with its respective pesticide treatment

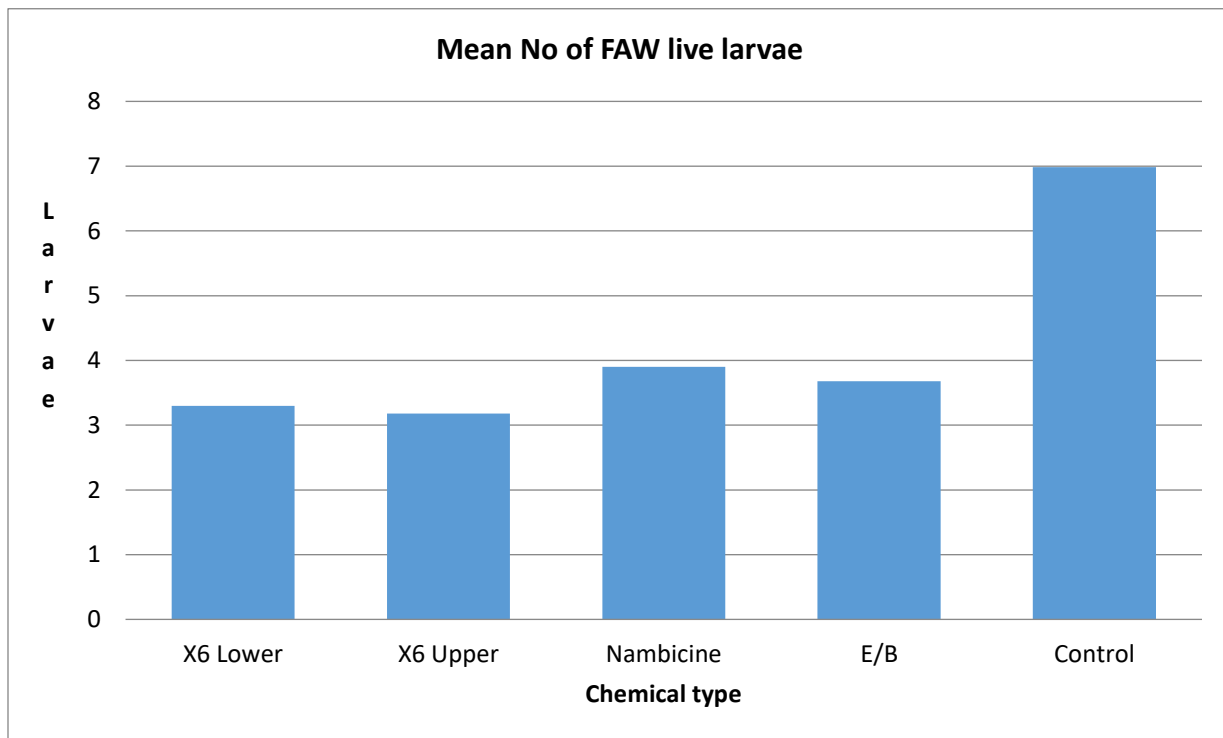
- ❖ For MICROBEBIO X6, the LOWER limit 6ml/Ltr and UPPER limit being 23.34ml/Ltr. These calculations were based on the recommendations on the product label
- ❖ The control experiment was WATER.
- ❖ All the experimental plots were to be sampled for the presence of live armyworm caterpillars (larvae) every after 10 days

The graph below indicates the performance of MICROBEBIO X6 and two other pesticides during the last three weeks:

PESTICIDE	PESTICIDE APPLICATION	Block/Replication/No of larvae					
		Lower					
MICROBEBIO X6		1R1	2R1	3R1	4RI	Average	Control 1
	1st	6	5	6	4	4.6	6
	2nd	5	5	3	3	4	6
	3rd	4	5	2	3	3.5	5
	4th	2	2	0	1	1.25	4
						3.3	5.2
		Upper					
	1st	9	6	7	4	6.5	11
	2nd	4	5	2	1	3	15
	3rd	3	3	2	0	2	7
	4th	2	1	1	1	1.25	5
						3.18	9.5
Nimbidine		1R1	2R1	3R1	4RI	Average	Control 1
	1st	7	6	5	5	5.7	8
	2nd	6	6	4	3	4.7	6
	3rd	5	5	3	3	4	5
	4th	3	0	2	1	1.5	9
						3.9	7
Emamectine+ Benzoete		1R1	2R1	3R1	4RI	Average	Control 1
	1st	7	4	7	9	6.75	8
	2nd	8	4	2	6	5	5
	3rd	3	1	4	0	2	6
	4th	2	0	2	0	1	6
						3.68	6.24
SUMMARY OF MEANS							
X6 Lower	3.3						
X6 Upper	3.18						
Nambicine	3.9						
E/B	3.68						
Contol	6.985						



Results



Observations

- ✓ Lower dosage 6ml/l, it performed as well as upper dosage of 23.34ml/l
- ✓ X6 performed better than other pesticides by having the smallest average number (3.3), of live insect larvae over the whole period of pesticide application
- ✓ With each successive spray, the population was going down.
- ✓ Control had the highest number of live caterpillars (6.985) where only water was sprayed

- ✓ There was no significant difference amongst the means of the three (3) different pesticides. From the results collected, MICROBEBIO X6 has shown to be an effective bio-pesticide of the fall armyworm and this is especially at lower concentrations and when the larvae are young.

Recommendations:

- It is recommended that the pest be controlled in its younger stages in order to reduce on the concentration of pesticide residues that are found in living organisms' tissues and the environment.
- The pesticides users should be encouraged to target the younger caterpillars for effective pesticides use and control.
- The trial should also be done in maize to see how it will perform in a different crop from wheat.