NAVSARI AGRICULTURAL UNIVERSITY

DEPARTMENT OF ENTOMOLOGY
N. M. College of Agriculture
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विद्या सर्वत्र गौरवा

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No. ACN/ENT/BCL/319 /2017, Navsari

Date: 14.07.2017

Through E-mail / NAU website

To,
In-charge of all research and
Extension centers, KVKs of NAU, Navsari

SUB: Mass production and distribution of microbial insecticides for demonstration and testing purpose... Regarding

REF: Office of the Director of Research and Dean PG Studies vide vernacular letter No. NAU/DR/T-1/5286/2017, Navsari Date: 08/06/2017

With reference to above cited subject and reference, Biocontrol Laboratory, Department of Entomology, N. M. College of Agriculture, NAU, Navsari has planned to mass produce and distribute the microbial insecticides for demonstration and testing purpose of the same on purely non-commercial basis in the interest of the farming community.

The following microbial insecticides are being produced in the laboratory and will be distributed to the farmers and our research and extension centers, KVKs, *etc.* as there is a great demand of the same.

1. NAUROJI *Beauveria bassiana* 1%WP (2×10^8 CFU/gm)
2. NAUROJI *Metarhizium anisopliae* 1%WP (2×10^8 CFU/gm)
3. NAUROJI *Lecanicillium lecanii* 1%WP (2×10^8 CFU/gm)

In this connection, all the research and extension centers of NAU are requested to place their demand well in advance only in prescribed '**PROFORMA**' to undersigned and concerned scientist has to collect the same product(s) personally from the bio-control laboratory and he/she has to submit the receipt of the same. The desired quantity will be provided on gratis basis. All the concerned scientist are requested to adopt standard methodology to apply these microbial insecticides on target pest and use the standard methodology to record the observations as attached in '**Annexure-I**' of this letter. The report of the same should invariably be send to email ID: **headentonau@gmail.com** at the end of crop. Any further assistance you may contact to Dr. M.R. Siddhapara, Assistant Research Scientist, Department of Entomology, NMCA, NAU, Navsari on cell No. 7600049204.

Your coordination and efforts will be highly appreciated on the timely submission of report to the undersigned.

Encl.: A/a

Professor and Head

Copy forwarded with respect to: (Through NAU website)

1. The Director of Research and Dean PG Studies, NAU, Navsari for kind information please.
2. The Principal, NMCA, NAU, Navsari for kind information please.

NAVSARI AGRICULTURAL UNIVERSITY

ડૉ.એસ.આર.ચૌધરી
ઇ/ચા.સંશોધન નિયામક અને
અનુસ્નાતક વિદ્યાશાખાધ્યક્ષ

સંશોધન નિયામકશ્રીની કચેરી
નવસારી કૃષિ યુનિવર્સિટી
એરૂ ચાર રસ્તા, નવસારી

ફોન : ૦૨૬૩૭ ૨૮૩૧૬૦
ફેકસ : ૦૨૬૩૭ -૨૮૩૪૫૨
E-mail : dr@nau.in, nau_dr@yahoo.co.in

જા.નં.નકૃયુ/સંનિ/ટી.૨/ ૧૨૮૫-૧૬/૨૦૧૭ તા. ૮ .૦૬.૨૦૧૭

પ્રતિ,
પ્રાધ્યાપક અને વડાશ્રી,
કિટકશાસ્ત્ર વિભાગ,
ન.મ.કૃષિ મહાવિદ્યાલય
નવસારી કૃષિ યુનિવર્સિટી,
નવસારી

મારફત : આચાર્યશ્રી, ન.મ.કૃષિ મહાવિદ્યાલય, નકૃયુ, નવસારી
વિષય : માયક્રોબિયલ પેસ્ટીસાઇડ વેચાણ કરવાની સૈધ્ધાંતિક મંજુરી આપવા બાબત...
સંદર્ભ : આપની કચેરીના પત્ર જા.નં. એસીએન/બી-૬/૭૬૫૮/ ૨૦૧૭ તા.૦૨.૦૫.૨૦૧૭

ઉપરોક્ત વિષયના સંદર્ભ પત્ર અન્વયે જણાવવાનું કે, આપના હસ્તક ચાલતી જૈવિક નિયંત્રણ પ્રયોગશાળામાં માયક્રોબિયલ પેસ્ટીસાઇડ (જેવાકે, બ્યુવેરીયા બાસીઆના, મેટારહેઝીયમ એન્સોપિલિ અને વેર્ટીસીલીયમ લેકાની) નું પ્રાયોગિક ધોરણે ઉત્પાદન ચાલુ કરેલ છે. સદર ટેકનોલોજીનો વ્યાપ ખેડુત આલમમાં વધે તે માટે આ માયક્રોબિયલ પેસ્ટીસાઇડની ખેતરમાં અસરકારકતા ચકાસવા માટે અત્રેની યુનિવર્સિટીના વિવિધ ફાર્મ તેમજ કૃષિ વિજ્ઞાન કેન્દ્ર અને પ્રગતિશીલ ખેડુતોને નિદર્શન માટે ગ્રેટીસ બિલથી આપવાની સંદર્ભપત્રથી મંજુરી માંગવામાં આવેલ છે. જે સબબ સ્ટેચ્યુટ-૧૨૧ આઇટમ નં. ૭૫(i)(i) મુજબ હેડ ઓફ યુનિટને સત્તા એનાયત થયેલ હોઇ, આગળની ઘટતી કાર્યવાહી આપની કક્ષાએથી હાથ ધરવા જણાવવામાં આવે છે.

Inword No. 913 Date. 13.6.17
Department of Entomology

8.6.17
સંશોધન નિયામક અને
અનુસ્નાતક વિધાશાખાધ્યક્ષ

Dr. MRS
13/06/17

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Proforma for demand of microbial insecticides

1.	**Name of Research and Extension center/ KVK**	**:**	
2.	**Name of the concern scientist along with mobile number and email address**	**:**	
3.	**Crop and variety**	**:**	
4.	**Area of the crop (in ha)**	**:**	
5.	**Season (Kharif/ Rabi/ Summer)**	**:**	
6.	**Pest scenario**	**:**	
7.	**Name of required microbial insecticides :**		

Sr.	Product Name	Required Quantity (Kg)
1	NAUROJI *Beauveria bassiana* 1%WP (2×10^8 CFU/gm)	
2	NAUROJI *Metarhizium anisopliae* 1%WP (2×10^8 CFU/gm)	
3	NAUROJI *Lecanicillium lecanii* 1%WP (2×10^8 CFU/gm)	

Signature and Designation

Major uses of microbial insecticides

Sr.	Name of microbial insecticide	Crop	Target pests
1.	***Beauveria bassiana***	Paddy	Leaf eating caterpillars (rice skipper, horn caterpillar, leaf roller, case worm)
		Cotton	Bollworms, leaf roller, whitefly
		Pigeon pea	Pod borer, Tur plum moth
		Castor	Semi looper, Spodoptera, capsule borer
		Tomato	Fruit borer
		Okra	Fruit and shoot borer
		Cabbage	Diamond back moth
		Chick pea/ Soyabean/ Indian bean	Pod borer
		Sorghum	Aphid
		Mustard	Aphid
		Vegetables	Aphid, jassid, thrips
2.	***Metarhizium anisopliae***	Sugarcane	Pyrilla, whitefly, white grub
		Paddy	Brown plant hopper, gundhi bug
		Cotton	Mealybugs
		Mango	Mango hopper, Mango mealybug
		Onion	Onion thrips
		Coconut	Rhinoceros beetle
		Mustard	Mustard aphid
		Vegetables	Leaf miner, aphid, jassids, thrips
3.	***Lecanicillium lecanii***	Cotton	Whitefly
		Citrus	Mealybugs, scale
		Mustard	Aphid
		Vegetables/ playhouse crops	Aphids, jassids, thrips, mealybugs

Annexure- I: METHODOLOGY

- **Paddy:**
  - Select five spots (1 m x 1 m each) randomly from rice field.
  - From each spot, select four clumps of rice randomly.
  - From each clump, count the total number of dead heart for rice yellow stem borer, total number of damaged leaves for leaf eating caterpillar, whereas total number of nymphs for brown plant hopper and white backed plant hopper.
- **Sugarcane:**
  - Select three spots each having three meter row length randomly from field of sugarcane.
  - Keep minimum distance of three rows between two spots.
  - From each spot, count the total number of tillers/canes and number of infested tillers/canes (damaged midrib, parallel holes on leaves, dead hearts or bunchy top) for sugarcane top borer; total number of tillers/canes and number of infested tillers/canes for early shot borer; randomly select ten plants and count the total number of leaves and damaged leaves for sugarcane whitefly and sugarcane pyrilla. For recording observations of sugarcane woolly aphid, count the total number of infested spots from entire plot.
- **Cotton:**
  - Select twenty plants randomly from field of cotton.
  - Count the total number of larvae of spotted boll worm and *Helicoverpa armigera* from the selected plants. For *Spodoptera litura* count the total number of larval colony from selected plants.
  - Select three leaves (top, middle and lower) from each selected plant and count the total number of nymphs and adults of aphids and thrips, nymph of jassids and adults of whitefly.
  - For recording observations of mealy bugs, index is used.
- **Other crops (Pigeon pea, Gram, Groundnut, Wheat, Finger millet, Nizer, Castor and Mustard.**
  - Select twenty plants randomly from field.
  - Count the total number of larvae of *Helicoverpa armigera* from the selected plants.
  - For pigeon pea pod fly, pluck five pods from each plant and record infested and healthy pods after opening the pods.
  - Count the total number of egg mass and larval colony of *Spodoptera litura* in groundnut.
  - Select three leaves compound leaves from top canopy and count the total number of nymphs of jassids.
  - For recording observations of aphid, aphid on groundnut index is used.
  - Count the total number of larvae of *Helicoverpa armigera* from the selected ear heads for wheat crop.
  - Count the total number of dead hearts or infested white ear heads for stem borer for finger millet.
  - For recording observations of Nizer aphid, aphid index is used.
  - Count the total number of larval colony of *Spodoptera litura* in castor.
  - Count the total number of larvae of castor semi looper from selected plants.
  - Select three leaves (top, middle and lower) from each selected plant and count the total number of nymph of castor jassids and adults of castor whitefly.
  - Count healthy and infested capsules for castor capsule borer.
  - Count the total number of larvae of mustard sawfly.
  - For recording observations of mustard aphid, aphid index is used.

- **Vegetable crops:**
  - Select twenty plants randomly from field.
  - Count the total number of healthy and infested shoots as well as fruits infested by shoot and fruit borer from selected plants.
  - Select three leaves (top, middle and lower) from each selected plant and count the total number of nymph of jassids and adults of whitefly.
- **Fruit crops (Mango, sapota etc.)**
  - Select ten trees randomly from mango orchard.
  - Randomly select ten shoots from periphery of each tree and count the total number of nymph and adults of mango hopper; record the presence of thrips from selected shoots after jerking the leaves on blank white paper.
  - Randomly select ten shoots from periphery of each tree and count number of the healthy and infested buds from selected shoots for chiku bud borer; count total number of healthy and infested leaves for chiku moth and chiku moth and leaf folder/leaf miner.

Observation sheet (for chewing type of pests)

Name of the center	**:**	
Crop/ variety	**:**	
Name of the target pest	**:**	
Name of microbial insecticide and date of application	**:**	

No. of Plants/ clumps	**No. of larvae/ damaged plant parts***		
	24 hr before application	**7 days after application**	**15 days after application**
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			
17.			
18.			
19.			
20.			
Total			
Average			

*It depends on pest category

Observation sheet (for sucking pests)

Name of the center	**:**	
Crop/ variety	**:**	
Name of the target pest	**:**	
Name of microbial insecticide and date of application	**:**	

No. of Plants/ clumps	**No. of nymph and adult per leaf**								
	24 hr before application			**7 days after application**			**15 days after application**		
	Top	**Middle**	**Bottom**	**Top**	**Middle**	**Bottom**	**Top**	**Middle**	**Bottom**
1.									
2.									
3.									
4.									
5.									
6.									
7.									
8.									
9.									
10.									
11.									
12.									
13.									
14.									
15.									
16.									
17.									
18.									
19.									
20.									
Total									
Average									