Sardarkrushinagar Dantiwada Agricultural University

Sardarkrushinagar

II. RESEARCH ON NATURAL FARMING

COMPLETED RESEARCH ON NATURAL FARMING:

A. Evaluation of different cow-based bio-enhancers for organic cultivation of chickpea

Treatments Details:

T_1*: Panchgavya* as foliar spray @ 3% at 30,45,60 DAS

T_2: *Bijamrut* as seed treatment @ 300 ml/kg seed

T_3: *Jivamrut* @ 500 L/ha with irrigation at sowing, 30,45 DAS

T_4: Amrut pani@ 500 L/ha with irrigation at sowing, 30,45DAS

T_5: *Sanjivak* @ 500 L/ha with irrigation at sowing, 30,45 DAS

T_6: Seaweed extract as foliar @ 5 % at 30,45 and 60 DAS

T_7: Banana sap as foliar spray@ 1% at30, 45 and 60 DAS

T_8: Vermicompost 1.5 t/ha

T_9: FYM 5 t/ha

T_{10}: Control

B. Evaluation of different cow-based bio-enhancers for organic cultivation of fenugreek

Treatments Details:

T_1*: Panchgavya* as foliar spray @ 3% at 30,45,60 DAS

T_2: *Bijamrut* as seed treatment @ 300 ml/kg seed

T_3: *Jivamrut* @ 500 L/ha with irrigation at sowing, 30,45 DAS

T_4: Amrut pani@ 500 L/ha with irrigation at sowing, 30,45DAS

T_5: *Sanjivak* @ 500 L/ha with irrigation at sowing, 30,45 DAS

T_6: Seaweed extract as foliar @ 5 % at 30,45 and 60 DAS

T_7: Banana sap as foliar spray@ 1% at30, 45 and 60 DAS

T_8: Vermicompost 1.5 t/ha

T_9: FYM 5 t/ha

T_{10}: Control

C. Eco-friendly Management of Pod borer, *Helicoverpa amrigera* in Chickpea

Treatments Details:

T_1*:* Neem seed kernel extract @ 5 % + Cow urine

T_2: Red chilli fruit (capsicum annum) + Cow urine

T_3: Garlic Clove *(Alium sativum)* + Cow urine

T_4: Custard apple leaves (*Annona reticulate* + Cow urine

T_5: Bael leaves *(Aegal marmelos)* + Cow urine

T_6: Naffatia (Morning Glory, Ipomoea spp.) + Cow urine

T_7: Akardo (Giant milkweed leaves, *Calotropis gigantia*) + Cow urine

T_8: Neem leaves (*Azadiracta indica*) + Cow urine

T_9: Dhatura leaves (*Devitrumpets datura*) + Cow urine

T_{10}: Cow urine

T_{11}: Control (Untreated)

ONGOING RESEARCH ON NATURAL FARMING:

1. Expt. Title: Evaluation of Natural Farming Practices in different agro-ecology

Sr.No.	Treatment	*Kharif* Crops Cowpea + Maize fodder (4:2)	*Rabi* Crops Fennel + Cabbage (1:1)-summer fallow
T_1	Control	Sole crop (Cowpea) (No addition of any inputs except labour for operations including weeding)	Sole crop (Fennel) (No addition of any inputs except labour for operations including weeding)
T_2	Complete NF	Cowpea + Maize fodder (intercrop) Beejamrit + Ghanjeevamrit @ 250 kg/ha + Jeevamrit @ 500 lit/ha/irrigation twice in a month + Mulching (fennel stover as mulch @ 2t/ha) + Whapasa (irrigation in alternate furrows)	Fennel + Cabbage (1:1) - (Intercrop) Beejamrit + Ghanjeevamrit @ 250 kg/ha + Jeevamrit @ 500 lit/ha/irrigation twice in a month + cabbage leaves as mulch in fennel crop @ 5 t per ha+ Whapasa (irrigation in alternate furrows)
T_3	NF-1 (without - Beejamrit + Ghanjeevamrit + Jeevamrit)	Cowpea + Maize fodder (intercrop) + Mulching (fennel stover as mulch @ 2t/ha) + Whapasa (irrigation in alternate furrows)	Fennel + Cabbage (1:1)- (Intercrop) Mulching (cabbage leaves as mulch in fennel crop @ 5 t per ha). Whapasa (irrigation in alternate furrows)
T4	NF-2 (without-crop residue mulching)	Cowpea + Maize fodder (intercrop) Beejamrit + Ghanjeevamrit @ 250 kg/ha + Jeevamrit @ 500 lit/ha/irrigation twice in a month + Whapasa (irrigation in alternate furrows)	Fennel + Cabbage (1:1)- (Intercrop) Beejamrit + Ghanjeevamrit @ 250 kg/ha + Jeevamrit @ 500 lit/ha/irrigation twice in a month + Whapasa (irrigation in alternate furrows)
T_5	NF-3 (without -	Sole crop (Cowpea) Beejamrit + Ghanjeevamrit @	Sole crop (Fennel) Beejamrit + Ghanjeevamrit @ 250

	intercropping)	250 kg/ha + Jeevamrit @ 500 lit/ha/irrigation twice in a month + fennel stover as mulch @ 2t/ha + Whapasa (irrigation in alternate furrows)	kg/ha + Jeevamrit @ 500 lit/ha/irrigation twice in a month + cabbage leaves as mulch in fennel crop @ 5 t per ha + Whapasa (irrigation in alternate furrows)
T_6	NF-4 without-Whapasa, irrigating in alternate rows and during noon)	Cowpea + Maize fodder (intercrop) Beejamrit + Ghanjeevamrit @ 250 kg/ha + Jeevamrit@500 lit/ ha/ irrigation twice in a month + fennel stover as mulch@ 2t/ha	Fennel + Cabbage (1:1)- (Intercrop) Beejamrit + Ghanjeevamrit @ 250 kg/ha + Jeevamrit @ 500 lit/ha/irrigation twice in a month + cabbage leaves as mulch in fennel crop @ 5 t per ha
T_7	AI-NPOF package	Sole crop (Cowpea) (20-40-00, NPK kg/ha) Details of manures and quantity to be applied (N based each of one third) 1. FYM 2. VC 3. Neem cake	Sole crop (Fennel) (90:30:00,NPK kg/ha) Details of manures and quantity to be applied (N based each of one third) 1. FYM 2. VC 3. Neem cake
T_8	Integrated Crop Management	Sole crop (Cowpea) (50 per cent nutrient application through organic manures and 50 per cent nutrient application through inorganic sources with use of Neemastra, Agniastra, Brahmastra and Dashparni ark for pest management) details of manures, inorganic sources and quantity to be	Sole crop (Fennel) (50 per cent nutrient application through organic manures and 50 per cent nutrient application through inorganic sources with use of Neemastra, Agniastra, Brahmastra and and Dashparni ark for pest management) details of manures, inorganic sources and quantity to be applied should be given

		applied should be given Organic sources (50 %, each of one third) 1. FYM 2. VC 3. Neem cake Inorganic sources (50 %, each of one third) N- P-K kg/ha)	Organic sources (50% , each of one third) 1. FYM 2. VC 3. Neem cake Inorganic sources (50 %, each of one third) N- P-K kg/ha)
T_9	Integrated Crop Management	Sole crop (Cowpea) (50% nutrient application through organic manures and 50% nutrient application through inorganic sources with application of need based pesticides for pest management) details of manures, inorganic sources and quantity to be applied should be given Organic sources (50 %, each of one third) 4. FYM 5. VC 6. Neem cake Inorganic sources (50 %, each of one third) N- P-K kg/ha)	Sole crop (Fennel) (50% nutrient application through organic manures and 50% nutrient application through inorganic sources with application of need based pesticides for pest management) details of manures, inorganic sources and quantity to be applied should be given Organic sources (50 %, each of one third) 7. FYM 8. VC 9. Neem cake Inorganic sources (50 %, each of one third) N- P-K kg/ha)
T_{10}	Conventional method	Cultivation of cowpea with all recommended package of practices	Cultivation of fennel with all recommended package of practices

General points

1. Permanent plots should be made and maintained without disturbance
2. Intercropping is to be practiced in only T_2, T_3, T_4 and T_6.
3. Pest management in T_2 to T_6 and T_8 using Neemastra, Agniastra, Brahmastra and dashparni ark inputs
4. Pesticide application (beyond ETL) only in T_9
5. No hand weeding in T_2 to T_6, T_7 and However HW is to be done in T_1, T_7 to T_9.

2. Expt. Title : Evaluation of Low cost Natural Farming in Wheat + Chickpea cropping System

Module –I: Low Cost Natural Farming

a) Inter cropping Wheat + Chickpea(8: 6)
b) Seed treatment with *bijamrut*
c) Soil application of *ghan Jivamrut* before sowing and *jivamrut* at sowing and 30 days interval with irrigation
d) Soil/organic/weed Mulch
e) Need based plant protection measures using *Agniashtra, Nimashtra, Brahmashtra* etc.

Module- II: Organic farming

a) Sole cropping Wheat and Chickpea
b) Soil application of 120 kg N/ha through 50 % through vermicompost + 50 % through FYM , Biofertilizers, *Panchgavya* etc
c) Plant Protection: Pheromone trap, *Tricoderma*, *Beauveria*, *Metarhizium*, NPV etc, if required.

Module-III: Conventional Farming

a) Sole cropping Wheat and Chickpea
b) Seed treatments with recommended fungicides/insecticides
c) Recommended dose of chemical fertilizers and manures
d) Plant Protection: Recommended fungicides, insecticides and herbicides, if required

3. Expt. Title : Evaluation of Low cost Natural Farming in Pearl millet + Green gram cropping system

Module –I: Low Cost Natural Farming

a) Inter cropping Pearl millet + Green gram (4: 2)
b) Seed treatment with *bijamrut*

c) Jivamrut @ 500 lit/ha with irrigation at sowing and then after monthly interval at 20,40 & 60 DAS + *ghan jivamrut* @ 250 kg/ha + FYM @ 250 kg/ha

d) **Achchhadan**: Crop residue mulch @2.5 t/ha (25 DAS)

e) **Plant protection**: *Agniashtra* (7 lit./acre in 200 lit. water), *Nimashtra* (200 lit./acre without water) and *Brahmashtra* (7 lit./acre in 200 lit. water) as and when required.

Module- II: Organic farming

a) Sole cropping Pearl millet and Green gram (as per area covered in LCNF)

b) **Biofertilizer:** N, P, K consortium @ 1.5 litre/ha as soil application, Varmicompost @ 2 t/ha, FYM @ 5.0 t/ha and Panchgavya @ 3.0 % at 20,40 & 60 DAS

c) **Plant Protection**:

Tricoderma herzanium (2.5 kg/ha as soil application) and *Metarhizium anisople* (2.5 kg/ha as soil application)

Beauveria basiana (40 g/10 lit. as spray for sucking pests) & HNPV (450 LE/ha) as and when required for *Helicoverpa* for both crops

Module-III: Conventional Farming

a) Sole cropping Pearl millet and Green gram (as per area covered in LCNF)

b) Seed treatments:

Pearl millet: Metalaxyl M-72 (Apron 35 SD) @ 3.0 g/kg seed

Green gram: Bavistin @ 3.0 g/kg seed

c) Recommended dose of chemical fertilizers and manures:

Pearlmillet: 80-40-00 kg N, P2O5, K2O/ha, FYM @ 5.0 t/ha

Greengram: 20-40-00 kg N, P2O5, K2O/ha, FYM @ 2.5 t/ha

d) Plant Protection: Recommended fungicides, insecticides and herbicides, if required

4. Expt. Title : Evaluation of *Go-Krupa Amrutam* in Wheat

T_1: *Go-Krupa Amrutam* Module

a) Soil aaplication of GKA compost 10t/ha before sowing

b) Seed treatment with 50:50 % GKA: Water solution

c) Soil application of GKA 2500 L/ha with 1st irrigation (at sowing) and then 3750 L/ha at 30 days interval (at 30,60 and 90 DAS)

d) Foliar application of 2 L GKA + 13 L water (starting from 15 DAS at weekly interval up to 90 DAS)

T_2: SPNF Module

a) Seed treatment with *Bijamrut* (200 ml/100 kg seed)

b) Soil application of *Ghan Jivamrut* 250 kg/ha and FYM 250 kg/ha

c) *Jivamrut* 500 L/ha with at sowing, 30, 60 and 90 DAS

d) Achchhadan at 25 DAS (5.0 t/ha)

T_3: FYM 10 t/ha + Soil application of NPK consortium 2 L/ha + 75 % RDF + plant protection as per need (Carboxin + Thirum @ 3.0 g/kg seed, Fipronil @ 6 ml/kg seed for control of termite, Herbicide: Pendimethalin @ 1.0 kg/ha as PE & Metsulfuronmethyl @ 8 g/ha as PoE at 30-35 DAS)

T_4: FYM 10 t/ha + 100 % RDF + plant protection as per need (Carboxin + Thirum @ 3.0 g/kg seed, Fipronil @ 6 ml/kg seed for control of termite, Herbicide: Pendimethalin @ 1.0 kg/ha as PE & Metsulfuronmethyl @ 8 g/ha as PoE at 30-35 DAS)

T_5: FYM 10 t/ha

5. **Expt. Title: Evaluation of different components of natural farming for different cropping sequences**

A. **Main Plot : Mulching (M):-**

M_0	No Mulching	No Mulching
M_1	Crop residue mulch @ 2.5 t/ha	Crop residue mulch @ 2.5 t/ha
M_2	Crop residue mulch @ 5.0 t/ha	Crop residue mulch @ 5.0 t/ha

B. **Sub Plot : *Ghanjivamrut* (G):-**

G_1	Seed treatment with *bijamrut* + *Ghanjivamrut @0.5t/ha* + *jivamrut @500 l/ha at sowing, 30 and 60 DAS* + *Jivamrut spray @ 7.5 % at 60 and 90 DAS*	Seed treatment with *bijamrut* + *Ghanjivamrut @1.0/ha* + *jivamrut @500 l/ha at sowing, 30 and 60 DAS* + *Jivamrut spray @ 7.5 % at 60 and 90 DAS*
G_2	Seed treatment with *bijamrut* + *Ghanjivamrut @0.75t/ha* + *jivamrut @500 l/ha at sowing, 30 and 60 DAS* + *Jivamrut spray @ 7.5 % at 60 and 90 DAS*	Seed treatment with *bijamrut* + *Ghanjivamrut @1.5t/ha* + *jivamrut @500 l/ha at sowing, 30 and 60 DAS* + *Jivamrut spray @ 7.5 % at 60 and 90 DAS*
G_3	Seed treatment with NPK consortium + FYM @5t/ha + *jivamrut @500 l/ha at sowing, 30 and 60 DAS*	Seed treatment with NPK consortium + CC @ 2.5t/ha + *jivamrut @500 l/ha at sowing, 30 and 60 DAS*