The Pharma Innovation Journal 2021; 10(10): 1261-1263

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; 10(10): 1261-1263

www.thepharmajournal.com
Received: 04-08-2021
Accepted: 17-09-2021

Manjula HB
Department of Seed Science and Technology, UAS, GKVK, Bengaluru, Karnataka, India

Parashivamurthy
Department of Seed Science and Technology, UAS, GKVK, Bengaluru, Karnataka, India

Siddaraju R
Department of Seed Science and Technology, UAS, GKVK, Bengaluru, Karnataka, India

Harish MS
Department of Seed Science and Technology, UAS, GKVK, Bengaluru, Karnataka, India

Corresponding Author:
Manjula HB
Department of Seed Science and Technology, UAS, GKVK, Bengaluru, Karnataka, India

Study the influence of new azadiractin products on seed storability of cowpea [*Vigna unguiculata* (L.) Walp]

Manjula HB, Parashivamurthy, Siddaraju R and Harish MS

Abstract
The experiment was conducted in University of Agricultural Sciences, Bengaluru. Cowpea variety IT-38956-1 was treated with different concentrations of neemazal and neemoz-gold with deltamethrin as chemical check among which neemazal @ 2.5 ml/kg was found to be effective with 100 seed weight (11.93 g), seed moisture content (10.33%), germination (85.66%), mean seedling length (12.59 cm), mean seedling dry weight (0.75 g), seedling vigour indices I & II (1078 & 64), field emergence (79.00%) and seed damage (11.41) which is on par with deltamethrin whereas, rest of treatments though effective in controlling bruchid infestation had detrimental effects on seed quality parameters.

Keywords: *Vigna unguiculata*, Neemal, neemoz-gold, germination, seed damage

Introduction
Cowpea (*Vigna ungiculata* (L.) Walp.) often known as 'poor man's meat' is major source of vegetarian protein with 23.5% of protein content. Due to its tolerance to sandy soil low rainfall areas, it is grown in arid and semiarid regions of Asia and Africa regions. With its ability fix atmospheric nitrogen, it is well suited for intercropping. It's a minor pulse crop in India, grown in 3.1 m. ha. with production of 1.92 m. t. In Karnataka it is grown in an area of 0.81 lakh ha with production and productivity of 0.32 lakh tonnes and 395 kg/ha. (Anon., 2016) [2, 3]. Bruchid (Callosobruchus maculatus) is a serious pest in storage that has potential to cause 100% loss (Kang *et al*., 2013) [5]. Most prominent method of controlling bruchids is by chemical methods *viz*., fumigation with ethylene dibromide (EDB), aluminium phosphide and carbon disulphide or dusting with malathion, carbaryl and permethrin. Due chemical toxicity, high cost, residual effect and harmful to environment botanicals treatments is more approachable. Use of neem leaves and seeds is an age old practice in india. Rather than using neem in its native form, using neem extracts is current trend especially azadirachtin, nimbin, nimbidine, salanin, etc in various concentractions. Neemazal T/S and Neemoz gold are neem extracts containing azadirachtin @ 10000 ppm. These are already known for controlling broad range of insects in field. Current experiment is to study the effectiveness of these products at three different concentractions in controlling bruchid population and maintaining seed quality.

Materials and Methods
Freshly harvested seeds of cowpea variety IT-38956-1 was obtained from AICRP-NSP (Crops), University of Agricultural Sciences, Bangalore. Seeds were then treated with neemazal and neemoz-gold at different concentrations with deltamethrin @ 1 ppm as chemical check and stored for nine months. The data were recorded from each replication for all the traits such as 100 seed weight (g), Germination (%), Mean seedling length (cm), Mean seedling dry weight (g), Seedling vigour index I and II, seed damage (%) and Electrical conductivity ($mScm^{-1}$). The results recorded were statistically analyzed as per the procedure given by Snedecor and Cochran, 1967.

Results and Discussion
Quality parameters
Significantly, higher 100 seed weight (12.63 g) was recorded in neemoz-gold @ 7.5 ml/kg treated and lowest of 11.80 g was recorded in untreated seeds. Higher seed weight in neemoz-gold @ 7.5 ml/kg treated seeds is attributed to less infestation of insects, higher percentage of weight loss in 100 seed weight was noticed in untreated seeds or control due to increased insect activity.

Results obtained in current studies are similar to Gupta *e*t al.* (2015) [4] in green gram, Ogbaji and Osuman (2011) [10] in cowpea.

Significantly lower seed moisture content was recorded in neemoz-gold @ 7.5 ml/kg treated seeds with highest being 11.72% in untreated seeds. Seeds acquired moisture with progress of storage period, this is primarily due higher relative humidity *i.e.,* RH in storage environment than in seed. Untreated seeds having highest infested seeds showed 42.06 per cent increase in seed moisture gain. Whereas, neemoz-gold @ 7.5 ml / kg treated seeds that had least infested seeds showed 24.84 per cent change in seed moisture content. Current findings are concurrent with Mishra (2015) [5] in greengram and blackgram, Nishad *et al.* (2017) [9] in chickpea.

Germination percentage significantly differed between treatments with highest (85.66%) noticed in neemazal @ 2.5 ml/kg treated seeds and lowest (45.33%) in neemoz-gold @ 7.5 ml/kg treated sedes. Decrease in germination percentage with increase in concentration of azadiractin products can be attributed to its detrimental effect at higher dose as observed in current studies. Germination percentage observations in current study are in partial agreement with Roopa (2006) [12] in muskmelon, Lamani and Deshpande (2016) [7] in cowpea, Sharma *et al.* (2016) [14] in pigeon pea

After nine months of storage there was significant difference between treatments for mean seedling length. Highest mean seedling length of 13.63 cm was observed deltamethrin @ 1 ppm treated seeds and lowest of 7.98 cm was observed in neemazal @ 7.5 ml/kg treated seeds. Azadiractin products were found to be detrimental for mean seedling length except neemazal @ 2.5 ml / kg (12.59 cm). Observations obtained concord with Rana *et al*. (2014) [11] in pea.

Significantly higher (0.79 g) mean seedling dry weight was recorded in deltamethrin @ 1 ppm treated seeds and lowest of 0.66 g in neemazal @ 7.5 ml/kg treated seeds. This reduction in dry weight is due to aged seeds, that accumulate toxic metabolites, produce abnormal seedlings. Corresponding results were obtained by Khatun *et al.* (2010) [6] in lentil, Amruta *et al*. (2015) [1] in black gram and Singh *et al.* (2017) [15] in lentil.

Deltamethrin @ 1 ppm treated seeds had significantly higher seedling vigour index I and II (1113 and 65) and lowest seedling seedling vigour index I and II (435 and 33) was noted in neemoz-gold @ 7.5 ml/kg treated seeds. Reduced vigour in azadiractin treated products is due to detrimental effect of azadiractin at higher concentration. (Mishra, 2014 and Jagtap *et al.,* 2016). Results obtained in current experiment are in agreement with Khatun *et al.* (2010) [6] in lentil, Sathish and Bhaskaran (2013) in blackgram and Singh *et al.* (2017) [15] in lentil.

Seed damage percentage varied from 5.50 to 21.16%. Neemoz-gold @ 7.5 ml/kg treated seeds has significantly lower seed damage of 5.50% and highest was observed in untreated seeds. seed damages *i.e.,* exit holes is due increased insect population level that surge with favourable conditions of temperature, which further may be due to loss of effectiveness of azadiractin products as they are exposed storage environment. Gupta *et al.,* 2015 [4] reported least developmental period of *C. maculatus* in neem leaf powder treated seeds. Difference between treatments is due to difference in concentration of insecticide added.

Table 1: Effect of new azadiractin seed treatment on seed storability of cowpea seeds after nine months of storage

Treatments	100 seed weight	Moisture content (%)	Germination (%)	Mean seedling length (cm)	Mean seedling dry weight (g)	Seedling vigour index-I	Seedling vigour index-II	Seed damage (%)
Neemazal T/S @ (Azadiractin 10,000 ppm) @ 2.5 ml / kg seed	11.93	10.33	85.66	12.59	0.75	1078	64	11.41 (19.73)
Neemazal T/S @ (Azadiractin 10,000 ppm) @ 5.0 ml / kg seed	12.26	10.43	56.33	10.03	0.73	564	39	8.50 (16.93)
Neemazal T/S @ (Azadiractin 10,000 ppm) @ 7.5 ml / kg seed	12.57	10.30	54.66	7.98	0.66	436	35	6.16 (14.36)
Neemoz- Gold (Azadiractin 10,000 ppm) @ 2.5 ml / kg seed	12.15	11.00	60.00	11.90	0.74	714	43	10.58 (18.97)
Neemoz- Gold (Azadiractin 10,000 ppm) @ 5.0 ml / kg seed	12.18	10.40	52.00	9.59	0.73	464	34	8.08 (16.50)
Neemoz- Gold (Azadiractin 10,000 ppm) @ 7.5 ml / kg seed	12.63	10.30	45.33	8.94	0.67	435	33	5.50 (13.55)
Deltamethrin @ 1ppm(2.8EC @0.04 ml / kg of seed)	11.86	10.60	81.66	13.63	0.79	1113	65	11.50 (19.81)
Control	11.80	11.72	69.66	11.35	0.72	791	51	21.16 (27.38)
S.Em.±	12.25	10.53	1.67	0.17	0.03	20.03	2.43	0.30
CD at 5%	0.19	0.42	5.05	0.52	0.09	60.57	7.37	0.93
CV (%)	0.90	2.30	4.58	2.77	7.59	4.95	9.13	2.90

NS- non signicant

Figures in the parentheses are arcsine transformed values

Conclusion

From the current experiment it can be concluded that neemazal @ 2.5 ml/kg is the most effective treatment with seed quality parameters significantly higher than untreated seeds and comparable to deltamethrin @ 1 ppm treated seeds. Thus, neemazal @ 2.5 ml/kg treated seeds can be stored upto nine months with maximum seed vigour and controlled insect population.

References

1. Amruta N, Sarika G, Umesha, Maruthi JB, Basavaraju GV. Effect of Botanicals and Insecticides Seed Treatment and Containers on Seed Longevity of Blackgram under Natural Ageing Conditions. J App. Nat. Sci 2015;7(1):328-334.
2. Anonymous Faostat 2016,
3. Anonymous State Agriculture Profile 2016, Http://Www.

Raitamitra. Kar. Nic.In.
4. Gupta S, Apte SD, Wast N. Efficacy of Some Plant Material On Green Gram (*Vigna radiata* L. Wilczek) Seed Against *Callosobruchus Maculatus* (Fab.). Europ. J Appl. Sci 2015;7(1):21-24.
5. Kang JK, Pittendrigh BR, Onstad DW. Insect Resistance Management For Stored Product Pest: A Case Study Of Cowpea Weevil (Coleoptera: Bruchidae). J Econ. Entomol 2013;106(6):2473-2490.
6. Khatun A, Kabir G, Bhuiyan MAH, Khanam D. Effect of Preserved Seeds Using Different Botanicals On Seed Quality of Lentil. Bangladesh J Agril. Res 2010;36(3):381-387.
7. Lamani K, Deshpande VK. Effect of Botanical Seed Treatment On Storability of Cowpea (*Vigna Unguiculata*). Int. J Adv. Life Sci 2016;5(2):539-544.
8. Mishra N. Relative Efficacy Of Certain New Molecules And Botanicals As Seed Protectant On Storability Of Green Gram And Black Gram Against Pulse Beetle *Callosobruchus Chinensis* L. Msc.(Agri.) Thesis, Ouat, Bhubaneshwar, Odisha 2015.
9. Nishad RN, Singh RB, Singh AK, Singh SP, Yadav SK. Effect Of Various Indigenous Botanical Seed Protectants On Seed Quality Parameters Of Chickpea Seed During Ambient Storage. J. Pharmacogn. Phytochem. 2017;1:423-426.
10. Ogbaji M, Osuman D. Insecticidal Actions of Some Botanicals on Storage Bruchid, *Callosobruchus Maculatus* (F.) Of Stored Cowpea (*Vigna unguiculata* L. Walp.). J. Trop. Agric 2011;10(2):29-34.
11. Rana K, Sharma KC, Kanwar HS. Efficacy Of Aqueous Plant Extracts On The Seed Quality Of Pea (*Pisum Sativum* L.) During Storage. Am. Int. J Res. Form., Appl. Nat. Sci 2014;6(1):07-11.
12. Roopa V. Influence of Post-Harvest Handling Techniques on Seed Quality and Storability of Muskmelon (*Cucumis melo* L.). *Msc. (Agri.) Thesis*, Submitted To Univ. Agric. Sci., Dharwad 2006
13. Sathish S, Bhaskaran M. Seed Dry Dressing With Botanicals To Improve Physiological Performance Of Fresh And Aged Seeds Of Black Gram (*Vigna mungo* L.) Afr. J. Agric. Res 2013;8(29):4049-4057.
14. Sharma R, Devi R, Yadav S, Sharma R, Sharma U, Kumar A, Godara P. Effect Of Some Botanicals Against Pulse Beetle, *Callosobruchus maculatus* (F.) Infesting Pigeon Pea. Legume Res 2016;39(6):1043-1047.
15. Singh P, Yadav S, Verma P, Chourasiya VK. Study On Botanical Treatment For Maintaining Longevity And Vigour During Ambient Storage. Int. J Pure App. Biosci 2017;5(2):449-455.
16. Snedecor WG, Cochran WG. Statistical Methods. Iowa State University Press, Usa 1967, 593.