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## ENHANCEMENT OF GROWTH AND PRODUCTION OF GLYCINE MAX L. BY AMRUTJAL

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### Abstract

Amrutjal is used for the enhancement of plant growth and production of *Glycine max L.* (soybean). *Glycine max L.* (soybean) is leguminous crop of Fabaceae family. Soybean is a kharif crop sown in monsoon season to increase the growth and production of *Glycine max L.* Amrutjal is used with different concentration with water 25%, 50%, 75%, and 100% and Water as control. Amrutjal is prepared by fresh cow dung 1 kg, cow urine 1 lit, jaggery 50 gm and it is dissolved in 10-liter water these are the basic ingredients for this product. All the materials were mixed in a plastic tub and kept undisturbed for 3 days to promote microbial multiplication. they are kept for 3 days undisturbed According to them, cow dung is a rich source of beneficial microorganisms and contains many bacteria. After 3 days, it is again mixed slowly by swirling hand/stick clockwise 12 times and anticlockwise 12 times. Stir slowly if you stir too violently then microbes may be killed. Stir by using wooden stick three times a day. This helps in distributing the microbes everywhere in the solution. From the second day onward the fermentation process is started from the fourth day microbial activities reaches we observed that the fermentation process starts on fourth day now Amrut Jal is ready to use. The six parameters of *Glycine max L.* are studied and results are calculated by statics method the parameters which are



observed and calculated are 1. Plant height 2. Leaves no. of a Plant 3. Pod no. of a Plant 4. Seed no. in a Plant 5. Seed weight of ten seeds 6. Root length of plant is calculated. So due to microbial activity, minerals and enzyme present in AmrutJal the plant growth and production of *Glycine max L.* (Soybean) increases by increasing concentration of AmrutJal 25% then 50%, then 75%, then 100% AmrutJal respectively. All six parameters growth development and production increases respectively. AmrutJal is made up of cow urine, cow dung, black jaggary and water Cow urine is component of Amrut Jal it has 95% water, 2.5% urea, 2.5% minerals enzyme, salts and hormones, contains iron, carbonic acid, potash, nitrogen, ammonia, calcium, phosphorus, salts, manganese, Sulphur, phosphate, potassium, urea, uric acid, amino acids, enzymes, cytokines, lactose etc. these are the growth enhancer. And cow urine contain bacteria s like *Bacillus mycoides*, *Enterococcus faecolis*, *Hafnia alvei*, *Paenibacillus pantothenicus*, *Escherichia coli*, *Proteus mirabilis*, *Staphylococcus epidermidis*, *Acimetobacter calcoacetius*, and *Erwinia rhapontic*. Cow dung contain bacteria *Bacillus* and *Clostridium* which are spore forming and makes soil fertile mainly used as organic fertilizers. Jaggery used in AmrutJal is for fermentation process by which microorganism and bacteria growth and multiply rapidly water used as universal solvent.

AmrutJal giving positive effect with increasing concentration and at 100% AmrutJal results were maximum due to bacteria, enzyme, minerals present in it. So by using AmrutJal we can get rid of chemical fertilizer, pesticide, weedicide and protect microorganism biodiversity which are beneficial for us and for environment.

Keywords:- AmrutJal



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## Introduction

Organic farming is the need of world in India from ancient time organic farming was old agriculture practices. India has the wealth of animal like cow and buffaloes there dung manure was used in broad aspects. Cow is worshiped in India many scientific research was done on cow milk cow urine cowdung manure and there advantges and maximum results are found positive. But from 20<sup>th</sup> century due to population growth and to make easy practices chemical fertilizers pesticide uses increased speedly withought knowing there negative effects we become habitual of chemical fertilizers and chemical and toxic pesticides weedicides and herbicides give results very fast but after some years we starts getting hazardous effect of these chemical practices it started effecting our health, environment getting polluted our friendly microorganisms and other animals that are very useful for farming are becoming extinct soil also got negative effects. Again organic farming practices increasing but due to old chemical practices the fertility of soil is decreased and production decreases. Cow urine Cowdung has the power of increasing microbial activity and it has many minerals and elements that can increase soil fertility (Gupta *et. al.*, 2016)<sup>1</sup>. AmrutJal is used for the enhancement of plant growth and production of *Glycine max L.* (soybean). *Glycine max L.* (soybean) is leguminous crop of Fabaceae family. Soybean is a kharif crop sown in monsoon season to increase the growth and production of *Glycine max L.* Amraljal is used with different concentration with water 25%, 50%, 75%, and 100% and Water as control. Amrutjal is prepared Amrut Jal is prepared by fresh cow dung 1 kg, cow urine 1 lit, jaggery 50 gm and it is dissolved in 10-liter water.



### Material and methodology

Amrutjal is prepared by fresh cow dung 1 kg, cow urine 1 lit, jaggery 50 gm and it is dissolved in 10-liter water these are the basic ingredients for this product. All the materials were mixed in a plastic tub and kept undisturbed for 3 days to promote microbial multiplication. they are kept for 3 days undisturbed According to them, cow dung is a rich source of beneficial microorganisms and contains bacteria per gram of cow dung. After 3 days, it is again mixed slowly by swirling handstick clockwise 12 times and anticlockwise 12 times. Stir slowly if you stir too violently then microbes may be killed. Stir by using wooden stick three times a day. This helps in distributing the microbes everywhere in the solution. From the second day onward the fermentation process is started from the fourth day microbial activities reaches we observed that the fermentation process starts on fourth day now Amrut Jal is ready to use. Preparing of Amrut Jal and Amrut Mitti (Fertile Nursery Soil by Deepak Suchde)<sup>2</sup>. *Glycine max good quality* seeds are selected and ten seeds are grown in each five plots with one feet distance in first plot control water is used in second plot 25% AmrutJal and 75% water is used in third plot 50% AmrutJal and 50% water is used in fourth plot 75% AmrutJal and 25% water is used and in Fifth plot 100% AmrutJal is used. and the different six parameters are statically calculated 1. Plant height 2. Leaves no. of a Plant 3. Pod no. of a Plant 4. Seed no. in a Plant 5 Seed weight of ten seeds 6. Root length of plant is calculated.

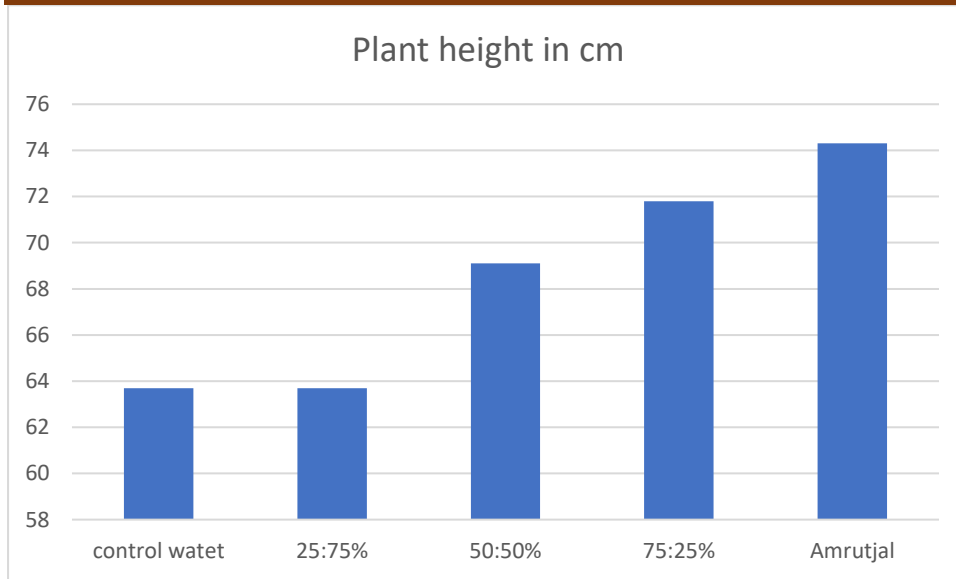


### Result and Discussion

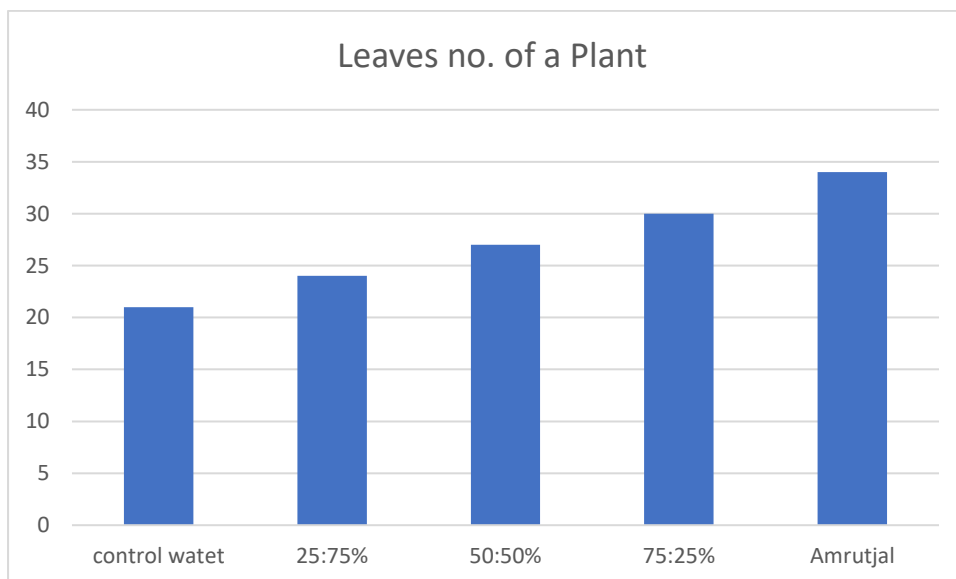
Growth development and production of *Glycine max L.* plant is studied by using AmrutJal and its different concentration and six parameter reading is calculated 1. Plant height 2. Leaves no. of a Plant 3. Pod no. of a Plant 4. Seed no. in a Plant 5. Seed weight of ten seeds 6. Root length. All Parameters of the plant is calculated statically.

Mean value of plant morphological parameters with different concentration with Amrut Jal					
Plant Parameters/Treatment	Control Water	25:75%	50:50%	75:25%	Amrutjal
Plant height	62.2 cm	63.7 cm	69.1 cm	71.8 cm	74.3 cm
Leaves no. of a plant	21	24	27	30	34
Pod no. of a plant	43	48	57	69	81
Seed no. in a Pod	3	3	3	3	3
Seed weight of ten seeds	0.48 gm	0.50 gm	0.53 gm	0.55 gm	0.62 gm
Root length	32.1 cm	37.3 cm	41.7 cm	44.9 cm	59.2 cm

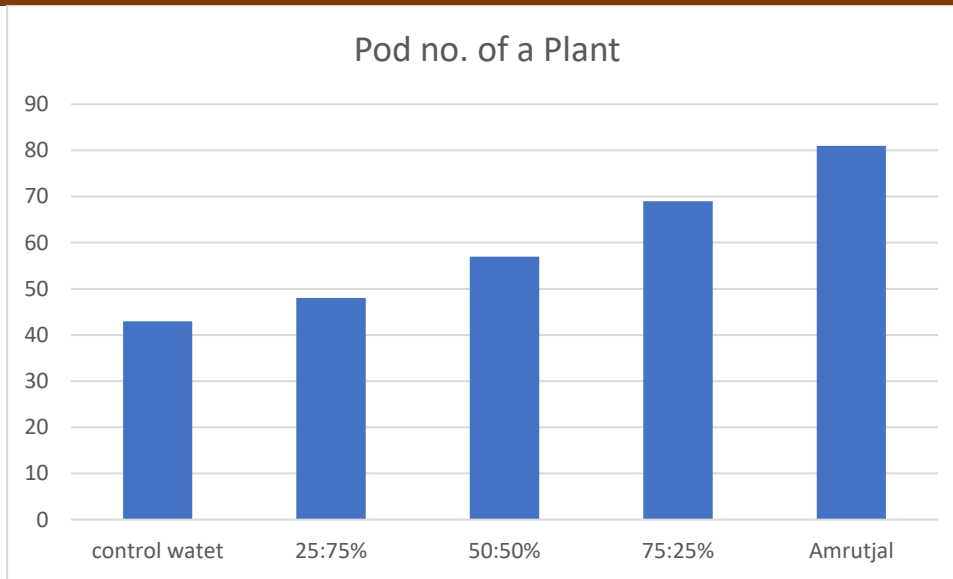
Highest Plant height of *Glycine max L.* we see in 100% AmrutJal is 74.3 cm.



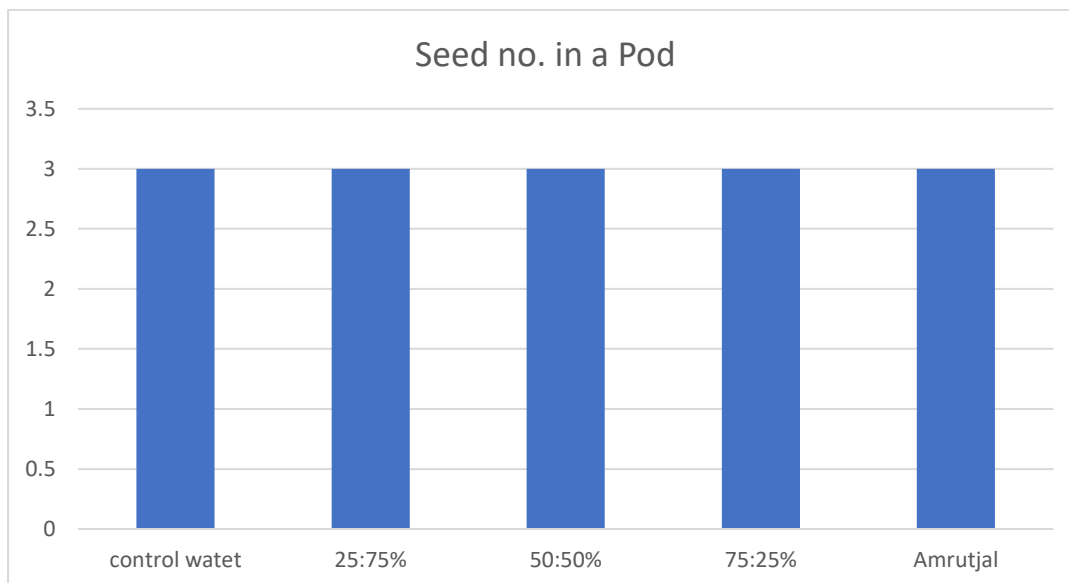
The highest Leaves no. of *Glycine max L.* we see in 100% AmrutJal is 34.



The highest Pod no. of *Glycine max L.* we see in 100% AmrutJal is 81.

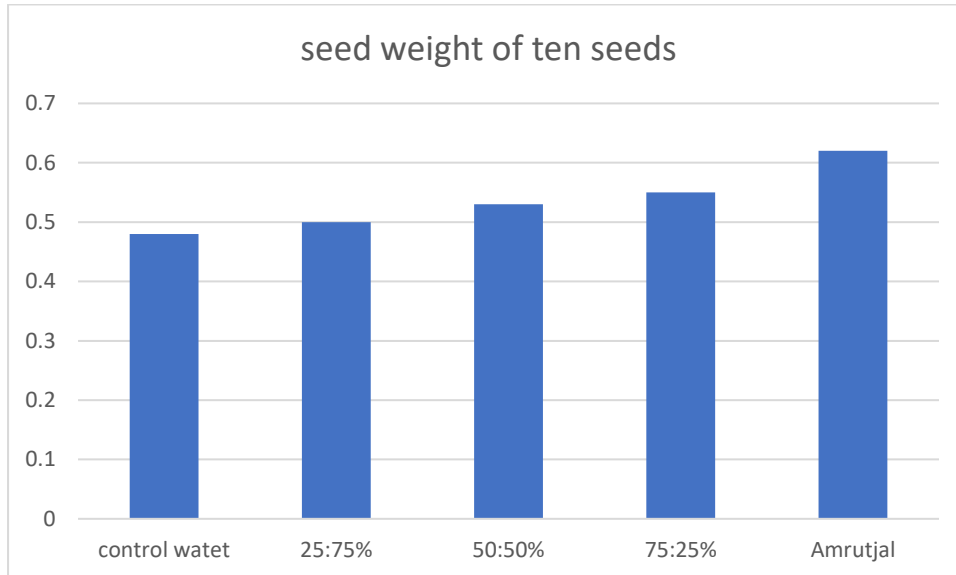


The highest Seed no. in a pod of *Glycine max L.* we see in 100% AmrutJal 3.

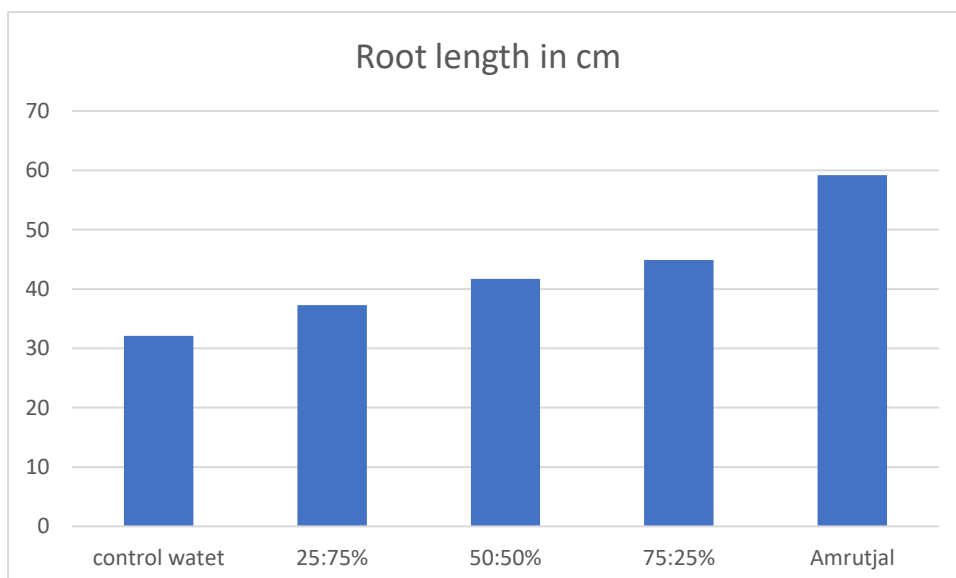




The highest Seed weight of ten seeds of *Glycine max L.* we see in 100% AmrutJal 0.62 gm.



The highest Root length of *Glycine max L.* we see in 100% AmrutJal is 59.2 cm.







AmrutJal is made up of cow urine, cow dung, black jaggary and water. Cow urine is a component of Amrut Jal; it has 95% water, 2.5% urea, 2.5% minerals, enzymes, salts, and hormones, and contains iron, carbonic acid, potash, nitrogen, ammonia, calcium, phosphorus, salts, manganese, Sulphur, phosphate, potassium, urea, uric acid, amino acids, enzymes, cytokines, lactose etc. These are growth enhancers. Cow urine contains bacteria such as *Bacillus mycoides*, *Enterococcus faecalis*, *Hafnia alvei*, *Paenibacillus pantothenicus*, *Escherichia coli*, *Proteus mirabilis*, *Staphylococcus epidermidis*, *Acinetobacter calcoaceticus*, and *Erwinia rhapontic*. (Boraiah, B., Devakumar, N., et al., 2017)<sup>3</sup>. Cow urine and cow dung can be used as natural pesticides (Suganthi, 2020)<sup>4</sup>.

Cow dung contains bacteria *Bacillus* and *Clostridium* which are spore-forming and makes soil fertile, mainly used as organic fertilizers. Cow dung contains phosphorus, potassium, nitrogen, magnesium, and calcium. (Mukhuba et al., 2018)<sup>5</sup>. Jaggery used in AmrutJal is for the fermentation process by which microorganisms and bacteria grow and multiply rapidly. Water is used as a universal solvent. Plant growth hormones like gibberellins, auxin, and cytokinin also help in manufacture by cow urine. (Yattoo et al., 2020)<sup>6</sup>. Soil fertility is increased by cow urine and fallow land can also be converted to fertile land very rapidly. (Pradhan et al., 2018)<sup>7</sup>.

AmrutJal gives a positive effect with increasing concentration, and at 100% AmrutJal, results were maximum due to bacteria, enzymes, and minerals present in it. So by using AmrutJal, we can get rid of chemical fertilizers, pesticides, and weedicides and protect microorganism biodiversity, which are beneficial for us and for the environment.



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