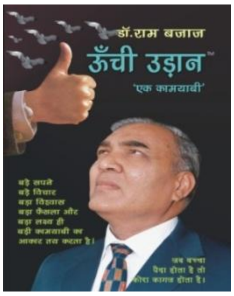
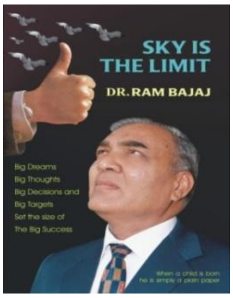
DR. RAM BAJAJ'S – EXCLUSIVE AGRICULTURAL FINDINGS

Date: 6th April 2015

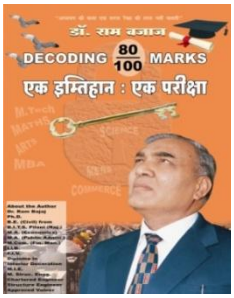


ऊँची उड़ान एक कामयाबी

99.99,99%
एक अमीर एक गरीब



SKY IS THE LIMIT



Decoding 80/100 Marks
एक इम्तिहान : एक परीक्षा

Ph.D,
B.E. (Civil Engineering) From
B.I.T.S, Pilani
M.A. (Economics)
M.A. (Public Admin.)
M.Com (Fin. Man.)
L.L.B.
Diploma In Interior Decoration M.I.E.
M. Struct E.
F.I.V
Chartered Engineer
Structural Engineer
Approved Valuer

Revolution in Chickpea crops by world's first Engineer Agriculture Scientist

Who reveals his first historical break through in the Agricultural field using first exclusive biofertilizer made of Root Nodules, Rhizobia & its culture of standing crop Chickpea at his field Estimated crops is double – Dr.Ram Bajaj

100% organic gram (चना) with zero chemical fertilizer, zero chemical pests, zero cost of production & zero tillage.

Chickpea (चना) legumes crops having "root nodules" that provide a home for symbiotic nitrogen fixing bacteria called "Rhizobia" were plucked crushed with root & shoots & mixed with Enriched tissue culture biofertilizer of Chickpea – not only boost plant nutrition but increase the number of pods & number of grain in each pod, because of right species of rhizobia.

- No.of pods (घेघरी) per plant (देशी चना) = 75 pods to 130 pods per plant against the normal plant = 40 pods to 60 pods
- No.of grain per pods = 2 to 3 grains against the normal pods = 0 to 2 grains per pod
- Weight of 100 grains = 18 to 19 gram against the normal crop = 14 gram per 100 grains
- Average grain per pod = 1.90 grains against the normal pod = 0.5 grains per pod
- Biomass = Double weight against single weight of normal crop with chemical fertilizer
- Height of plants = 45cm to 60cm against normal height = 35cm to 45cm

*Preliminary research shows that chickpea consumption may **lower blood cholesterol**.*

<u>Site open for inspection till April 20, 2015 by pre-appointment. Send your experts immediately</u>

The **chickpea** or **chick pea** (*Cicer arietinum*) is a legume of the family Fabaceae, subfamily Faboideae. It is also known as **gram.** Its seeds are high in protein. It is one of the earliest cultivated legumes (chickpea): 7,500-year-old remains have been found in the Middle East.

1. Description

The plant grows to between 20–50 cm (8–20 inches) high and has small feathery leaves on either side of the stem. Chickpeas are a type of pulse, with one seedpod containing two or three peas. It has white flowers with blue, violet or pink veins.

Desi has small, darker seeds and a rough coat. It is grown mostly in India and other parts of the Indian subcontinent. The *desi* type is used to make *chana dal*, which is a split chickpea with the skin removed.

Chickpeas are a nutrient-dense food, providing rich content (> 20% of the Daily Value, DV) of protein, dietary fiber, folate, and certain dietary minerals such as iron and phosphorus. Thiamin, vitamin B6, magnesium and zinc contents are moderate, providing 10-16 percent of the DV. Chickpeas have a Protein Digestibility Corrected Amino Acid Score of about 76 percent, which is higher than fruits, vegetables, many other legumes (chickpea), and cereals.

A 100 g serving of cooked chickpeas provides 164 kilocalories (690 kJ). Carbohydrates make up 68 percent of calories, most of which (84 percent) is starch, followed by total sugars and dietary fiber. Lipid content is 3 percent, 75 percent of which is unsaturated fatty acids for which linoleic acid comprises 43 percent of total fat.

2. Technology used in – Biofertilizer : <u>Root Nodules is Nectar (अमृत)</u>

Chickpea legumes crops have root nodules that provide a home for symbiotic nitrogen – fixing bacteria call "Rhizobia", Rhizobia normally lives in the soil under & nearby chickpea plants. If we pluck (तोड़ना) some root nodules from root's of chickpea plants with underneath soil of plants having colonies of rhizobia (normally lives in the soil) are taken out and make them treated with media (Dry or Liquid); who receive rhizobium inoculation of right species of right micro organisation (Rhizobia) of chickpea. Actually they are responsible for the Bumper production. The biofertilizer having root nodules, underneath soil of chickpea with living plants were made at site & **used in their chickpea crop. This home made biofertilizer of root nodules is Nectar (अमृत) for the chickpea crop with old residue of previous crops (Humus).**

Root Nodules & pods 120 to 130 in the crops showing by Mr.Phool Singh Rathore

Root Nodules & pods 120 to 130 in the crops showing by Dr.Ram Bajaj

3. Materials and Method used for manufacturing of Biofertilizer at field

In order to study the effects biofertilizer inoculation on grain yield, yield components and protein content of Chickpea. The sowing was done directly without ploughing and normal own seeds of Chickpea (देशी चना) were planted at a target in rows with spacing of 0.1 meter between rows.

Sowing was done in the month of November, between 15 to 20 November 2014 with tractor on available bed with spreading of humus i.e. residue of previous crops during sowing. The plants will be harvested at maturity and traits such as plant height, number of grains per pod and 100-grains weight will be recorded on 20 randomly selected plants plot. Seed protein content will be recorded. Number of pods per unit of area, grain yield and biological yield will be obtained by harvesting an area of 3 m^2 from the middle of each plot to avoid marginal effects.

4. Type of solid & liquid biofertilizer enriched chickpea – root nodules & root tissues were used in present experiment

A. Solid – Biofertilizer

Bio F/cow manure enriched organic mixed compost i.e Dry Cow dung (100kg), Gypsum (जिप्सम-Humus) (10kg), Black soil (10kg), Red soil (10kg), Wooden Ash (10kg), Crop residue (10kg), Cow urine (10 litter), Blue, Green Algae (काई) (2kg), (floating over watercourse or in the canal). Goat's Manure (मिंगनी) (1kg), 1 kg. Molasses (गुड़) & 1 kg. Chickpea Flour (बेसन) two or three Green chickpea crop's complete plants with root & shoot which includes soil under plants (current standing crops) were used. Plus two to three root nodules plucked & crashed with roots & shoot of chickpea & fermentation for three days at normal temperature. Then grow an advance nursery 20ft.x20ft. of chickpea in September month.

B. Liquid Biofertilizer

Bio F/suspension fungal spores–1 kg. Molasses (गुड़) & 1 kg. Chickpea Flour (बेसन) Cow dung (10kg), Cow's urine (10 litter) and 1 kg. of the each of above Bio F. materials suspension were grown in 200 litre of water with seven days fermentation at normal temperature. So obtained fungal solid-biofertilizer item spores culture was used as Bio F/suspension Contained 3.5–6.15 x 10^6 spores/ml approximately. 8 to 10 Root Nodules plucked crushed with root & shoot of chickpea & hand full of soil under plant is also to be mixed with above liquid media – which is a key factor in this biofertilizer.

5. Optimizing leaf area index key to achieving high chickpea yields

One of the key drivers in chickpea yield is leaf area index or what's commonly known as green area index (GAI). GAI is the ratio of green plant material that covers a square meter of land and has a direct influence on crop vigour, root development, moisture use efficiency, weed suppression, carbohydrate storage and nutrient transport. In a nutshell, obtaining optimum GAI's can build bigger chickpea yields with less water and nutrients.

<u>Measuring Green Area Index</u>

1. To quantify the amount of nitrogen taken up by the crop prior to bolting, a 1 square metre quadrant is placed in a representative area of crop. The entire green mass (stems and leaves) on this area is cut off at ground level and weighed (including dead leaves). Alternatively you can take a picture of 1 square metre of area standing above the crop and insert it into the BASF online GAI measurement tool

Measuring the height of plant = 45cm to 60cm

2. The weight of the green mass (stems and leaves) is measured in kilograms and multiplied by a factor of 0.8. This will give you a Green Area Index number. For example, 1 kg of green mass from 1 square metre would equate to a GAI of 0.8. (1kg × 0.8 = 0.8 GAI) or (0.750kg × 0.8 = 0.6 GAI)

<u>Calculating nitrogen uptake and N application rate</u>

1. It is assumed that each GAI of 1 contains 50kg/ha of N within the crop.
2. Now, multiply your GAI × 50 kg/ha to calculate the amount of nitrogen in the crop. For example: 0.75 GAI × 50 kg/ha = 37.5 kg/ha N within the crop.
3. Next, the optimum sized canopy at full growth (bolting) has a GAI of 3.5. We need to build the crop canopy up to a target GAI of 3.5. Example: 3.5 - 0.75 = 2.75 GAI
4. To calculate the nitrogen necessary to build an additional GAI of 2.75 we need to multiply 2.75 GAI × 50 kg/ha. For example: 2.75 GAI × 50 kg/ha = 137.5 kg/ha N

6. Legumes (chickpea) and their Nitrogen-Fixing Bacteria

Legumes (chickpea) have root nodules that provide a home for symbiotic nitrogen-fixing bacteria called *rhizobia*. This relationship is particularly common in nitrogen-limit conditions. The Rhizobia convert nitrogen gas from the atmosphere into ammonia, which is then used in the formation of amino acids and nucleotides.

A. <u>Root Nodules</u>

Root nodules are formed when nitrogen fixing bacteria called rhizobia enter the cells of a host plant.

Rhizobia normally live in the soil and can exist without a <u>host</u> plant. However, when legume plants encounter low nitrogen conditions and want to form a symbiotic relationship with rhizobia they release flavinoids into the soil. Rhizobia respond by releasing nodulation factor (sometimes just called *nod factor*), which stimulates nodule formation in plant roots. Exposure to nod factor triggers the formation of deformed root hairs, which permit rhizobia to enter the plant. Rhizobia then forms an infection thread, which is an intercellular tube that penetrates the cells of the host plant, and the bacteria then enter the host plants cells through the deformed root hair. Rhizobia can also enter the root by inserting themselves between cracks between root cells; this method of infection is called *crack entry*. Bacteria enter the root cells from the intercellular spaces, also using an infection thread to penetrate <u>cell walls</u>. Infection triggers rapid <u>cell division</u> in the root cells, forming a nodule of tissue.

The relationship between a host legume and the rhizobia is symbiotic, providing benefits to both participants. Once the rhizobia have established themselves in the root nodule, the plant provides <u>carbohydrates</u> in the form of malate and succinate, and the rhizobia provide ammonia for the formation of amino acids. Many legumes (chickpea) are popular agricultural crops specifically because they require very little fertilizer: their rhiziobia fix nitrogen for them. Used properly some legumes (chickpea) can even serve as fertilizer for later crops, binding nitrogen in the plant remains in the soil.

B. <u>Key Points of chickpea – Rhizoiba & Nodule</u>

1. Rhizobia normally live in the soil, but when there is limited soil nitrogen, legumes (chickpea) release flavonoids which signal to rhizobia that the plant is seeking symbiotic bacteria.
2. When exposed to flavonoids, the Rhizobia release *nodulation factor*, which stimulates the plant to create deformed root hairs. Rhizobia then form an "infection thread" which allows them to enter the root cells through the root hairs.
3. Once the rhizobia are inside the root cells, the root cells divide rapidly, forming a nodule.
4. The rhizobia create ammonia from nitrogen in the air, which is used by the plant to create amino acids and nucleotides. The plant provides the bacteria with sugars.

Standing crop with pods (120 to 130 pods) in the field Madhav Diggi

7. At least 50% Increase the productivity by use of Biofertilizer

The most important constraint limiting crop yield in developing nations worldwide, and especially among resource-poor farmers, is soil infertility. Therefore, maintaining soil quality can reduce the problems of land degradation, decreasing soil fertility and rapidly declining production levels that occur in large parts of the world needing the basic principles of good farming practice. Minerals [Black & Red soil (10kg), Gypsum (जिप्सम) (10kg), Ash (राख) (10kg)], Organic components (crop residue of previous crops), and microorganisms are three major solid components of the soil. They profoundly affect the physical, chemical, and biological properties and processes of terrestrial systems. Biofertilizer are the products containing cell of different types of beneficial microorganisms. Thus, biofertilizers can be important components of integrated nutrients management. Organisms that are commonly used as biofertilizers component are nitrogen fixers (N-fixer), solubilizer (K-solubilizer) and phosphorus solubilizer (P-solubilizer), or with the combination of moulds or fungi. These potential biological fertilizers would play key role in productivity and sustainability of soil and also protect the environment as eco-friendly and cost effective inputs for the farmers. By using the biological and organic fertilizers, a low input system can be carried out and it can help achieving sustainability of farms.

Standing crops of chickpea at Madhav Diggi & Khajuwala plant height = 45 to 60cms

8. What is the biofertilizer?

The term biofertilizer or called 'microbial inoculants' can be generally defined as a preparation containing live or latent cells of efficient strains of nitrogen fixing, phosphate solubilizing or cellulytic microorganisms used for application of seed, soil or composting areas with the objective of increasing the numbers of such microorganisms and accelerate certain microbial process to augment the extent of the availability of nutrients in a form which can be assimilated by plant. In large sense, the term may be used to include all organic resources (manure) for plant growth which are rendered in an available form for plant absorption through microorganisms or plant associations or interactions.

9. Biofertilizer Making

There are several things need to be considered in biofertilizer making, such as microbes' growth profile, types and optimum condition of organism, and formulation of inoculum. The formulation of inocula, method of application and storage of the product are all critical to the success of a biological product. In general, there are 6 major steps in making biofertilizer. These includes choosing active organisms, isolation and selection of target microbes, selection of method and carrier material, selection of propagation method, prototype testing and large scale testing. First of all, active organisms must be decided. For example, we must decide to use whether organic acid bacteria or nitrogen fixer or the combination of some organisms. Then, isolation is made to separate target microbes from their habitation. Usually organism are isolate from plants root.

Biofertilizers are usually prepared as carrier based inoculants containing effective microorganisms. Incorporation of microorganisms in carrier material enables easy-handling, long-term storage and high effectiveness of biofertilizers. Sterilization of carrier material is essential to keep high number of inoculant bacteria on carrier for long storage period. Gamma irradiation or autoclaving can be used as method for sterilization.

For optimum plant growth, nutrients must be available in sufficient and balanced quantities. The most important constraint limiting crop yield in developing nations worldwide, and especially among resource-poor farmers, is soil infertility. Unless the fertility is restored in these areas, farmers will gain little benefit from the use of improved varieties and more productive cultural practices. Soil fertility can be restored effectively through adopting the concept of integrated soil fertility management (ISFM) encompassing a strategy for nutrient management-based on natural resource conservation, biological nitrogen fixation (BNF) and increased efficiency of the inputs.

Biofertilizers are important components of integrated nutrients management. These potential biological fertilizers would play key role in productivity and sustainability of soil and also protect the environment as ecofriendly and cost effective inputs for the farmers. They are cost effective, ecofriendly and renewable source of plant nutrients to supplement chemical fertilizers in sustainable agricultural system.

Biofertilizers are products containing living cells of different types of microorganisms which when, applied to seed, plant surface or soil, colonize the rhizosphere or the interior of the plant and promotes growth by converting nutritionally important elements (nitrogen, phosphorus) from unavailable to available form through biological process such as nitrogen fixation and solubilization of rock phosphate. Beneficial microorganisms in biofertilizers accelerate and improve plant growth and protect plants from pests and diseases.

Rhizobium inoculation is well known agronomic practice to ensure adequate nitrogen of legumes instead of N-fertilizer. In root nodules the O2 level is regulated by special hemoglobin called leg-hemoglobin. This globin protein is encoded by plant genes but the heme cofactor is made by the symbiotic bacteria. This is only produced when the plant is infected with *Rhizobium*. The plant root cells convert sugar to organic acids which they supply to the bacteroids. In exchange, the plant will receive amino-acids rather than free ammonia.

10. Most Important Microorganisms Used In Biofertilizer

Organisms that are commonly used as biofertilizers component are nitrogen fixers (N-fixer), potassium solubilizer (K-solubilizer) and phosphorus solubilizer (P- solubilizer), or with the combination of molds or fungi. Most of the bacteria included in biofertilizer have close relationship with plant roots. *Rhizobium* has symbiotic interaction with legume roots, and Rhizobacteria inhabit on root surface or in rhizosphere soil.

A. Nitrogen

Nitrogen is one of the major important nutrients very essential for crop growth. Atmosphere contains about 80 percent of nitrogen volume in Free State. The major part of the elemental nitrogen that finds its way into the soil is entirely due to its fixation by certain specialized group of microorganisms. Biological Nitrogen Fixation (BNF) is considered to be an important process which determines nitrogen balance in soil ecosystem. Nitrogen inputs through BNF support sustainable environmentally sound agricultural production. The value of nitrogen fixing legumes in improving and higher yield of legumes and other crops can be achieved by the application of biofertilizers.

Biological nitrogen fixation is one way of converting elemental nitrogen into plant usable form. Nitrogen-fixing bacteria (NFB) that function transform inert atmospheric N2 to organic compounds. Nitrogen fixer or N fixers organism are used in biofertilizer as a living fertilizer composed of microbial inoculants or groups of microorganisms which are able to fix atmospheric nitrogen. They are grouped into free-living bacteria (*Azotobacter* and *Azospirillium*) and the blue green algae and symbionts such as *Rhizobium*, *Frankia* and *Azolla*.

Co-inoculation of some *Pseudomonas* and *Bacillus* strains along with effective *Rhizobium* spp. is shown to stimulate chickpea growth, nodulation and nitrogen fixation. The highest sugar, protein, starch contents, nodule weight and seed nitrogen, potassium, phosphorus of chickpea were obtained from combined application of phosphate solubilizing bacteria, *Rhizobium* and *Trichoderma* fungus.

B. Phosphorus

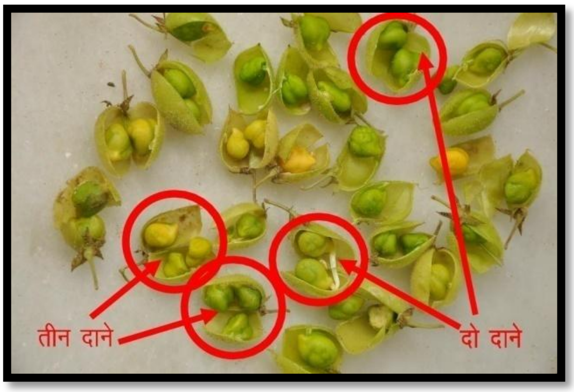
The fixed phosphorus in the soil can be solubilized by phosphate solubilizing bacteria (PSB), which have the capacity to convert inorganic unavailable phosphorus form to soluble forms HPO4 2- and H2PO4 - through the process of organic acid production, chelation and ion exchange reactions and make them available to plants. Therefore, the use of PSB in agricultural practice would not only offset the high cost of manufacturing phosphate fertilizers but would also mobilize insoluble in the fertilizers and soils to which they are applied. Bacteria are more effective in phosphorus solubilization than fungi. Among the whole microbial population in soil, phosphate solubilizing bacteria (PSB) constitute 1 to 50%, while phosphorus solubilizing fungi (PSF) are only 0.1 to 0.5% in P solubilization potential. Number of PSB among total PSM in soil was around 88 %. Microorganisms involved in phosphorus acquisition include mycorrhizal fungi and PSMs. Among the soil bacterial communities, ectorhizospheric strains from *Pseudomonas* and *Bacilli*, and endosymbiotic rhizobia have been described as effective phosphate solubilizers.

11. Crop Responses to Inoculation

Symbiotic nitrogen fixer and phosphate solubilizing microorganisms play an important role in supplementing nitrogen and phosphorus to the plant, allowing a sustainable use of nitrogen and phosphate fertilizers. The promoting of plant growth can be achieved by inoculation with aggregated and single cell suspensions of *A. brasilense*. The inoculation of single cell suspensions of *Azospirillum* significantly increased the root surface area, root and foliage dry weight of the chickpea.

No.of pods per plants varies from 75 pod to 130 pods per plants

Findings showed that application of biofertilizers had a significant effects on nutrient uptake of chickpea combined application of Phosphate solubilizing bacteria and *Trichoderma harzianum* produced the highest leaf P content (0.33%) and grain P content (279 mg 100 g-1). Ability of *Bacillus* sp. to produce organic acid such as gluconic, citric and fumaric acids under P-limiting conditions may increase the solubility of poorly soluble phosphorus. These findings also showed that chickpea inoculated with biofertilizers have significantly higher grain protein content. Maximum protein content (%15.06) was observed in the treatment that received a combined inoculation of PSB and *T. harzianum*.



Showing open pods having 2 to 3 grains per pod.

12. Plant height (P H): 45cm to 60cm

The plant height was significantly affected by biofertilizer inoculation. The highest plant height is observed in 45cm to 60cm. The minimum plant height was recorded as 38cm. Application of biofertilizer increased plant height by 20%.

13. Number of pod per plant: 75 to 130 pods

Number of pod increased with the increase of N application rate. The highest 130 pods were recorded in the field as per our plant populations with minimum pods as 75.

14. Number of grains per pods: 2 to 3 pods

Biofertilizer inoculation had statistically significant effects on number of grains per pod. The highest number of grains per pods is recorded 3 grain per pod – to minimum 1 grain per pod with average of number of grain.

15. 100-grains weight per pod: 18 gram to 19 gram

100 –grains weight was significantly affected by biofertilizer inoculation. The increase of bionitrogen application rate increased significantly the weight of 100-grains in chickpea.

16. Biological yield (B Y)

Biological yield of chickpea also showed the same trend as grain yield. Moreover, chickpea plants that were treated with biofertilizer had higher biomass than plants untreated with this inoculum. Inoculation with biofertilizer increased the biological yield about 10%.

17. Abstract

In Bikaner (Rajasthan), information on the biological nitrogen (N_2) fixation capacity of grain legumes (chickpea) in the field is scarce. N_2 fixation by chickpea was evaluated over two consecutive years. Crop growth and N_2 fixation varied between sites and years. The legumes (chickpea) derived more than 60% of their N from the atmosphere under favourable soil conditions, but the proportion was reduced when the availability of soil moisture and molybdenum (Mo) were constrained. Annual rates of N_2 fixation by uninoculated chickpea varied from 76 to 125 kg N ha^{-1}, with a regular rainfall distribution during the growth cycle (the first year experiment), and from 55 to 72 kg N ha^{-1} under drought stress (the second year experiment). Annual rates of N_2 fixation by uninoculated peas varied from 31 to 107 kg N ha^{-1} with regular precipitation, and from 4 to 37 kg N ha^{-1} under drought stress. Chickpea was tested only in a drought year, when it fixed from 19 to 24 kg N ha^{-1}. Mean values for N derived from the atmosphere by chickpea varied from more than 70% at one location to less than 45% at another, where Mo was later found to be deficient. Inoculation with Rhizobium leguminosarum did significantly affect the N_2 fixed by fixed 50% or more N after inoculation. Inoculation with *Bradyrhyzobium cicer* did not improve fixation by chickpea. Based on the N economy of the shoots, it appeared that any N addition to the soil in harvest residues varied with crop and location.

The present field study was undertaken to determine the effects of tillage systems on spring chickpea (*Cicer arietinum* L.) yield over 2 years, and the effects of tillage systems and residual N on chickpea biomass, seed yield and yield components over 4 years, in a chickpea (*Triticum aestivum* L.)–chickpea rotation under rainfed conditions. Tillage treatments included no-tillage and conventional tillage. Biofertilizer rates were 0, 50, 100 and 150 kg N ha^{-1}, applied only to chickpea. Seed yield was strongly dependent on rainfall during the preceding fallow period, as well as during the flowering and seed-filling period. Maximum seed yield (about 1500 kg ha^{-1}) was achieved with around 390 mm rainfall in those periods. Application of biofertilizer N to chickpea at a rate of 100 kg N ha^{-1} consistently influenced subsequent chickpea seed yield due to the carryover effect of biofertilizer N. Residual fertilizer N did not appear to affect chickpea N fixation, illustrating the inability of this legume to stock up with N. Biomass and harvest index were the two parameters most closely related to chickpea seed yield. Seeds per pod was the yield component exerting the greatest direct positive influence on seed yield. The compensatory effect of yield components on chickpea yield was very limited, since the indirect effects of these components were negligible.

The interactive effect of rhizotrophic microorganisms on the yield and nutrient uptake of chickpea plants and soil was determined in a sandy clay loam soil, deficient in available phosphorus (P). Plant yield and nutrient uptake were significantly enhanced as a result of inoculation with *Rhizobium* sp. and phosphate solubilising microorganisms (PSM), *Pseudomonas striata* or *Penicillium variable*. Plant yield and nutrient uptake were further augmented by the addition of AM fungus. In addition, the available P status of the soil improved by the addition of *P. striata* with *Rhizobium* sp. and AM fungus. The nitrogen content of the soil did not show appreciable changes after the inoculation. The population of phosphate solubilising microorganism in combinations on root infections and spore density of the AM fungus in the soil showed increase between 60 and 90 days of plant growth.

Legumes (chickpea) have a symbiotic relationship with bacteria called rhizobia, which create ammonia from atmospheric nitrogen and help the plant.

18. Location of Testing the fields

<u>Cultivation in sandy soil field at:</u>

(a) Phool Singh Rathore Mob.No. 09782260627

(b) Madhav Diggi village of Khajuwala Tehsil; located at 92KM of Bikaner–Khajuwala Road, Bikaner (Rajasthan) contact person: Gulab Sonar, Mob.No.: 09928329063

(c) Sattasar village at RD 615/616 of main I.G.N.P canal; located at 72KM of Bikaner–Chhatargarh Road, Bikaner (Rajasthan) contact person: Ghewar Ram, Mob.No.: 09001045580

(d) Total land cultivated at both location is approximately 100 Bigha (165ft x 165ft) = 40 hectare – chickpea only.

Note:

1. **Crops is on a maturity stage and there is possibility of 20% of damage of crop because of recent rain with thunder storm having wind velocity = 80km/hr.**

2. **Showing open pods having 2 to 3 grains per pod. There is also a single grain but there is extra ordinary big.**

3. **Height of Chickpea = 45 cm to 60cm**

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