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Use of pressmud and biofertilizer influence economic of pea cultivation

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Abstract
Input-output data on farm trails of three most popular pea varieties of eastern Uttar Pradesh cultivated under low cost input like biofertilizer were collected during 2002-03 2003-04 from the experimental field of the Indian Institute of vegetable Research Varanasi, The highest yield and benefit ratio per unit input ratio was found when the crop was cultivated under pressmud@5t/ha with seed treated by *Rhizobium* plus soil application of PSB.A return ratio of 2.8rupees per rupee invested was realized in fresh vegetable pea and pea seeds under pressmud with biofertilizer which accounted net profit of 180% to 190%. Maximum net return and cost benefit ratio 1: 3.2 was realized in Arkel when market as fresh vegetable. Maximum net return and cost benefit ratio was obtained when pea grain was marketed.

Keywords: Pressmud, biofertilizer, economic, pea cultivation

Introduction
The modern Agriculture technology has influenced productivity use of cost input like, pressmud, a by product of sugar industry Bio fertilizers (N-Fixers, P solubilizers, etc.) holds vast potential for the supply of major plant nutrient like nitrogen and phosphorus and sulphur. The locally available low cost input like pressmud and biofertilizers could be an economically viable option to use in pea crop and may be proved as boon especially to small and marginal farmers bio-fertilizers can provide to the small and marginal farmers.

Materials and Methods
The present experiment was conducted during rabi season of 2001-2002, 2002-2003 and 2003-2004 in a sandy loam alluvial soil or Indio Gangetic plains of Varanasi region Seeds of three prominent vegetable pea varieties of eastern Uttar Pradesh, namely Arkel, Azad Pea 1 and Azad Pea 3 were sown in field site and in. Total six treatments combinations were in the experiments where T_1 control, T_2 seed treatment in *Azotobacter*. T_3, Seed treatments in PSM, T_4 Seed treatments in *Rhizobium*, T_5 seed treatment in *Rhizobium* along with PSB, T_6 Seed treatments in *Azotobacter* along with PSM T_7 pressmud @5t/ha and T_8 FYM5t/ha were evaluated in RBD.
The strain of nitrogen fixinging bacteria and phosphate solubilizers microorganism were originally isolated from agronomic soil in IIVR Varanasi, and were used for trails experiment.
The phosphorus solubilizers were cultured PSB and nitrogen fixer culture *eg*. *Rhizobium leguminosarum*. Seed inoculation alone or dual inoculation with *Rhizobium*, *Azotobacter* and phosphate solubilizing bacteria in soil or seed treated before seed sowing. Culture slurry of biofertilizer was prepared by adding @200 gm each biofertilizer in 10litters water was prepared separately, the seed were dipped in biofertilizer slurry for 15 minute and thoroughly mixed to get uniform coating on all the seeds. Again the seeds were treated with PSB slurry in the same manner and shade dried for on other 15minute then the uniform coated seeds were dibbled in the field immediately. Required and measured quantity of seeds were taken in plastic bucket (25littr capacity) and recommended quantity of individual biofertilizers. Pea fruits were harvested at breaker stage from each subplot and marketable fruits only weighed for yield determination. In addition to yield and yield contributing traits, the data were also recorded on marketable yield and price fetched by the crop. The costs of cultivations in general vis-à-vis net returns and cost: benefit ratios were worked out for all the varieties and treatment.

Condition of Soil

The soil was air –dried and ground to pass thoroughly a 2 mm sieve and mixed thoroughly. The basic properties of the soil were as fallows pH 7.6, EC 0.41 dSm^{-1}, available N 270 kg ha^{-1}, P_2O_5 18 kg ha^{-1} and K_2O 180 kg ha^{-1} sulphur 10 kg ha^{-1}, organic carbon 0.38% and (Ca^{+2} + Mg^{+2}) 6.42 meq/100 g soil.

Table 1

Treatment	Cast of cultivation	Yield q/ha		Gross return		Net return		Return/rupee invested	
		Grain	Fresh	Grain	Fresh	Grain	Fresh	Grain	Fresh
T0	11180	5.9	38.3	29780	26810	18600	15630	1.7	1.4
T1	13620	8.4	67.9	42090	47530	28470	33910	2.1	2.5
T2	13620	8.7	72	43605	50400	29985	36780	2.2	2.7
T3	13620	9.4	72.4	46540	50680	32920	37060	2.4	2.7
T5	13940	8.9	75.2	44315	52640	30375	38700	2.2	2.8
T6	13940	8.8	75.3	43845	52710	29905	38770	2.1	2.8
T7	13620	7.9	59.6	39390	41720	25770	28100	1.9	2.1
T8	13620	7.3	59.1	36700	41370	23080	27750	1.7	2.0
LSD $_{0.05}$		0.74	11.5						

Grain yield

Application of pressmud @ 5 t/ha along with seed treatment in *Rhizobium* and PSB @ 5 kg/ha soil application T_5 (930.8 kg/ha) T_4 (886.3 kg/ha) and T_3 (876.9 kg/ha) registered 56.27% 48.80% and 47.22%, respectively, higher grain yield over control. The additional cost incurred trans for low cost input for out yielded the return out put leading to a high net return per rupee invested.

Fresh pod weight

The highest pod yield (q/ha) were found under application of pressmud @ 5 t/ha along with seed treated in *Rhizobium* and soil application of PSB @ 5 kg/ha followed by application of pressmud @ 5 t/ha with seed treated in *Azotobacter* + PSB @ 5 kg/ha soil application which registered 96.6%, to 88%, higher fresh pod yield over control.

Significantly higher yield and yield attributes were obtained under pressmud @ 5 t/ha along with seed treated in Rhizobium and soil application of phosphate solubilizing bacteria @ 5 kg/ha, compared to single or un-inoculated crop. Inoculation with *Rhizobium* and PSB resulted more availability of N and P, which caused significant improvement in crop growth rate and leaf area index. The improvement was more conspicuous under dual inoculation because associative effect between Rhizobium and PSB inoculation resulted in significant increase in growth and yield attributes compared to single or un-inoculated plot. This favorable effect of combined inoculation might by due to increased availability of N and P, in root zone. (Singh and Singh 1992) [5].

PSB can promote plant growth by altering root growth and morphology of root, increase water and mineral nutrient absorptive capacity in general further stimulates more yield Downey and Vonkessel (1990) [3], Heisinger (1998) Chamber (1992) [2]. More pronounced effect of combined inoculation (*Rhizobium* and PSB) on yield attributes over single or uninoculated was also observed by Alagawadi and Gaur (1988) [1] Tyagi *et al* (2003) [8] Tanwar *et al* (2003) [7] Srivastava and Ahlawat (1995) [6].

The maximum net return and cost benefit ratio was found under treatment pressmud @ 5 t/ha along with *Rhizobium* and PSB at par to seed treated in *Azotobacter* and Rhizobium in case of marketing of fresh pod of vegetable pea. Rhizobium+PSB proved more economic than Rhizobium or PSB with Pressmud. Rhizobium or PSB with Pressmud proved more beneficial than Rhizobium or PSB alone. Reported by Sharma and Namdeo (1999) [9].

Table 2

Variety.	Cast of cultivation	Yield q/ha		Gross return		Net return		Return/rupee invested	
		Grain	Fresh	Grain	Fresh	Grain	Fresh	Grain	Fresh
Arkel	13620	6.9	57.57	34735	57570	21115	43950	1.5	3.2
AP-1	13620	9.9	74.6	49940	52220	36320	38600	2.6	2.8
AP-3	13620	7.5	62.9	37675	56610	24055	42990	1.8	3.2
		0.5	15.1						

Variety evaluation data indicated significantly lowers Arkel of grain and fresh pod yield compared Azad P-1 and AzadP-3. The maximum net return of rupees and cost benefit ratio of fourty three thousand nine hundred fifty two and cost benefit ratio (1:3.2) was realized by Arkel at par Azad P3 compared to Azad P1 (1:2.8) in case of fresh pod sailing. Whenever the maximum net return and cost benefit ratio of rupees thirty six thousand three hundred twenty and cost benefit ratio was realized by (1:2.6 in Azad P1 compared to Azad P3 and Arkel (1:1.8, and 1:1.5) respectively in case of dry seed sailing.

References

1. Alagawadi AR, Gaur AC. Associative effect of Rhizobium and phosphate solubilizing bacteria on yield and nutrient up take by Check pea. Plant and Soil. 1988; 105:241-246.
2. Chambers JW. Influence of a commercial fungal inoculant (PB-50) on plant nutrient availability and crop growth. M.sc. Thesis. Univrsity of Monitob, Winnipeg. M.B, 1992.
3. Daweny J, Vankessel C. Dual inoculation of *Pisum sativum* with *Rhizobium leguminosarum* and *Penicillium bilaji*. Biol. fertile. soils. 1990; 10:194-196.
4. Pers JRR, Sabel AR, Vorgess MAT. Fixation of atmospheric Nitrogen by peas in credos soil. Informe Agropecuareo. 1989; 14:14-19.
5. Singh RS, Singh RP. Effect of sulphur fertilization and Rhizobium inoculation on yield and nutrient content and uptake in pea in different soils of Uttar Pradesh. Indian. J Agric. Res. 1992; 26(2):57-64.
6. Srivastava TK, Ahlawat IPS. Response of pea *(Pisum sativum*) to phosphorus, molybdenum and biofertilizer.

Indian J Agron. 1995; 40(4):630-635.
7. Tanwar SPS, Sharma GL, Chohor MS. Effect of phosphorus and Bio-fertilizer and on yield nutrient content and uptake by black gram (*Vigna mungo* L.). Legume Res. 2003; 21(1):39-41.
8. Tyagi MK, Singh CP, Bhattachoraya P, Sharama NLS. Dual inoculation effect of *Rhizobium* and *Phosphate solubilizing bacteria* (PSB) on pea (*Pisum sativum* L). Indian J Agric Res. 2003; 37(1):1-8.
9. Sharma KN, Namdeo KN. Effect of biofertilizers and phosphorus on growth and yield of soybean (*Glycine max* (L.) Merrill). Crop-Research-Hisar. 1999; 17(2):160-163.