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Popularization of improved variety of groundnut “VL Moongphali-1” to increase production of groundnut through FLD at Tawang district of Arunachal Pradesh

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ABSTRACT : With an objective to popularize of improved variety of groundnut demonstration were conducted during 2013-16 on an area of 22.0 hectare with active participants of 60 farmer's at different locations of Tawang district of Arunachal Pradesh, with improved variety of "VL Moongphali-1" and integrated crop management (Seed rate-70kg/ha. kernel seed treatment with thiram 75% WP@3g/kg seed). The result revealed that maximum mean yield 20q/h. With an increase 54% due to more number of pod/plant (20pods/plant) with average plant height 45 cm over local check (13q/h) in which only 12 pods/plant were observed. Improved variety of groundnut "VL Moongphali-1" recorded progressively increased yield during three years of study from 13.0 to 20.0 q/ha. The production gap can be bridged by use of improved variety and recommended package of practices (optimum seed rate, balanced nutrition and recommended plant protection measure). Improved technology gave higher net return of Rs. 82,000/- per hectare with benefit cost ratio of 2.3:1 as compared to local check (Rs. 40,333/- per hectare and benefit cost ratio of 1.7:1).

KEY WORDS : Groundnut, Variety, Yield, Improved technology, Benefit cost ratio

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Groundnut (*Arachis hypogaea* L.) is an annual legume and is also known as peanut, earthnut, goober pea, goober, pindas, jack nut, manila nut, pygmy nut, pignut, and monkey nut. The term monkey nut is often used to mean the entire pod. Groundnut seeds (kernels) contain 35.8- 54.2 per cent oil (Jambunathan *et al.*, 1985), 16.2-36.0 per cent protein (Dwivedi *et al.*, 1990) and 10-20 per cent carbohydrate (Salunkhe *et al.*, 1992). The seeds are also a good source of minerals like calcium, phosphorus and iron and vitamins like E, niacin,

folacin, riboflavin and thiamine. Groundnut haulms constitute nutritious fodder for livestock. They contain protein (8-15%), lipids (1-3%), minerals (9-17%) and carbohydrate (38-45%) at levels higher than those of the cereal fodders. The digestibility of nutrients in groundnut haulm is around 53 per cent and that of crude protein is 88 per cent in animals (Nagaraj, 1988). Groundnut kernels are consumed directly as raw, roasted or boiled or used for oil extraction. Groundnut is used for culinary purposes and also for a host of other purposes. Groundnut and its

products are also used as an animal feed (seeds, oil pressings and green and dried haulms) and industrial raw material (oil and deoiled cakes). After harvest the roots left behind in the soil add valuable nutrients to the soil. These multiple uses of groundnut plant make it an excellent crop for domestic markets as well as for foreign trade in several developing and developed countries.

Groundnut (*Arachis hypogaea* L.) is one of the most important oilseed crops of Arunachal Pradesh. It occupies 18,470 ha. With total production 24,560 mt. (A.O.P., 2017-18). Major growing district are Lower Dibang Valley, Papumpare, Lohit, Changlang, East Kameng, West Siang and Tawang. The groundnut is the only nut that grows below the earth. The groundnut plant is a variable annual herb, which grows upto 50 cm in height. The flowers of the plant develop a stalk which enters into the soil, forms a pod containing generally two seeds. They become mature in about two months, when the leaves of the plant turn yellow. Groundnut is a tropical and subtropical crop. The plant grows well in an area where the temperature is from 21-26.6°C and annual rainfall of 50-125 cm. Lower temperature is not suitable for its proper development. During maturity it requires about a month of warm and dry weather. Groundnut prefers sandy loam soil (Singh, 2008).

The groundnuts are consumed in many ways and various forms. They may be eaten raw, boiled, steamed or roasted. They are sometimes eaten as a sweetmeat by coating them with sugar. A large number of food products are prepared from the groundnuts (Agrikar *et al.*, 1970). Groundnuts may be used for preparing nutritive and tasty milk. In Tawang district it is grown in an area of 72.5 ha with total production 1001 qt. The productivity is very low (13.0 q/ha.) The groundnut productivity in Tawang district is low due to non-availability of improved varieties for specific area as well as lack of knowledge about package of practices. The productivity of groundnut can be increased by adopting recommended scientific management practices using a suitable improved variety for area, taking into account the above consideration, frontline demonstrations (FLD) were carried out in a systematic manner on farmers' field to show the worth of a new variety and convincing farmers to adopt improved production management for enhancing productivity of groundnut.

RESEARCH PROCEDURE

Front line demonstration on Groundnut were

conducted by Krishi Vigyan Kendra, Tawang during 2013-16 on an area of 22.0 hectare with active participants of 60 farmer's in eight villages viz., Soma, Chaksam, Poito, Namtsering, Luntsang, Yusur, Dharmeling and Khirmu. They acquired all relevant information for the cultivation of this crop. The area falls under humid, subtropical climate. The daily temperature of the experimental site during the year varies widely between minimum 13°C and maximum 27°C with an average rainfall of 2,211.8 mm. The soil was sandy loam with slightly acidic (pH 6.2), high in organic carbon (0.85%), electrical conductivity 0.25ds/m and available N 283.kg/ha., phosphorous 14.7kg/ha. and potassium 211 kg/ha. Wheat was grown as the previous crop in these experimental plots during all the three years. The component demonstration of front line technology in groundnut was popularized of improved variety "VL Mongphali-1", proper tillage, proper seed rate (70kg/ha kernel), proper seed treatment (Thiram 75% WP@3g/kg seed), proper sowing distance (30x15 cm.), Balanced dose of nutrition (F.Y.M-6.0 tonnes/ha+56 kg urea+375 kg S.S.P.+68 kg M.O.P.) (Dutta, 2006). Since there was enough rainfall during the crop season, irrigation was not required. The critical stages for irrigation are flowering, peg formation and pod development. The life saving irrigation should be provided during these stages (Ahlawat and Prakash, 1997). The weeds reduction in yield to the extent of 20-40 per cent. Two hand weeding should be done, first weeding 25 days after sowing and the second 45 days after sowing before commencement of flowering (Howard and Khan, 1915).

RESEARCH ANALYSIS AND REASONING

The comparison between improved and local variety, and it was observed that groundnut variety -VL Mongphali-1 was grown under the supervision of K.V.K scientist, when farmer's were not using improved variety, proper method of sowing, Balanced use of nutrition, seed treatment, water management, weed management and plant protection measure, which were demonstrated under FLD plots. The cultivation of Improved variety was very good performance and give more yield of groundnut at farmers fields and this variety was observation recorded height of plant (cm), branches/plant, pods/plan, seed/pod.

The data (Table 1) revealed that branches/plant (6-8), number of pod/plant (18-20) and seed/pod (2-2.5) was higher compared to local variety, branches/plant (4-6), number of pods/plant (13-17) and seed/pod (1.5-2.0).

Table 1: The yield attributes obtained under improved variety v/s local variety of groundnut

Sr. No.	Parameters	Improved variety	Local variety
1.	Plant height (cm)	40-50	45-55
2.	Branches / plant	6-8	4-6
3.	Pod / plant	18-20	13-17
4.	Seed / pod	2-2.5	1.5-2.0

Table 2: Economics of improved and local variety of groundnut

Sr. No.	Year	Cost of cultivation (Rs./h)		Gross return (Rs./h)		Net return (Rs./h)		B:C ratio		Yield (q/h)	
		IV	LV	IV	LV	IV	LV	IV	LV	IV	LV
1.	2013-14	59,000	47,000	1,40,000	84,000	81,000	37,000	2.3:1	1.7:1	20.0	12.0
2.	2014-15	57,000	53,000	1,47,000	98,000	90,000	45,000	2.5:1	1.8:1	21.0	14.0
3.	2015-16	58,000	52,000	1,33,000	91,000	75,000	39,000	2.2:1	1.7:1	19.0	13.0
Mean	-	58,000	50,666	1,40,000	91,000	82,000	40,333	2.3:1	1.7:1	20.0	13.0

IV-Improved variety, LV- Local variety

which ultimately resulted in higher pod yield 20.0 q/ha.

On an average pod yield of improved variety of groundnut under front line demonstration was higher by 54 per cent as compared to local variety (13q/h). The result indicated that the demonstration has given good impact in terms of yield and net income. The higher productivity of groundnut under improved variety and adoption of improved package of practices for groundnut production. The cultivation of improved variety of groundnut through front line demonstration was very good performance give more yield of groundnut observed at farmer's field. The net returns under FLD plots (Rs. 82,000/- per ha) increased by 103 per cent over the farmer's practices (Rs. 40,333/- per ha). The benefit cost ratio is higher (2.3:1) as compared to farmer's practices (1.7:1).

Conclusion:

The Improved variety of groundnut "VL Moongphali-1" produces a significant positive result and provided the researcher an opportunity to demonstrate the productivity potential and profitability of the improved variety (Intervention) under real farming situation, which they have advocating for long time. This variety was newly in Tawang district of Arunachal Pradesh. The productivity gain under this variety over existing local variety of groundnut motivated to other farmers to adopt for cultivation of improved variety of groundnut. Now, farmers are one of the cheerful farmers in the region. He enjoying improved variety of groundnut cultivation with his family. He had brought two yak from the earning of improved variety of groundnut from one hectare.

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