



Research Article

POPULAR AND PROFITABLE GROUNDNUT CULTIVATION: SUCCESS STORIES OF FARMERS IN RAIGAD

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Abstract: The suitable package of practices developed by Dr. B. S. Konkan Krishi Vidyapeeth, Dapoli for groundnut crop in Konkan have the highest groundnut productivity (1800 kg ha⁻¹) over national productivity during *rabi*. The different package of practices with suitable varieties for groundnut in different zones of India also recorded higher yields. Roha, Dist. Raigad district imply they have higher yield with TKG Bold variety with recommended package of practices, which showed there is massive scope for increasing groundnut crop in Konkan particularly in Raigad district during *Kharif* as well as during *Rabi* cum summer season.

Keywords: Groundnut, Konkan, Package of practices, Yield

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Introduction

Cultivated groundnut (*Arachis hypogaea* L.) or peanut is a self-pollinated annual legume crop, widely grown for its high quality edible oil and food use in the tropical and warm temperate regions of the world. The nine oilseeds namely groundnut, rapeseed-mustard, soybean, sunflower, safflower, sesame, niger, castor and linseed, accounted for an area of 23.44 million hectares with the production of 25.14 million tonnes [1]. India is the second largest groundnut producing nation in the world with an annual production of 5.64 million tonnes pods after China (15.71 million tonnes pods). Groundnut is important cash crop and is low-priced commodity but has valuable source of all the nutrients. About 7.5 million hectares are put under it annually and the production is about six million tonnes. Out of total area and productivity, 70% area and 75% of the production have been concentrated in the five states namely Gujarat, Andhra Pradesh, Tamil Nadu, Karnataka and Maharashtra [2]. In Konkan region groundnut is grown on 20,000 ha area with 1800 kg ha⁻¹ productivity. The groundnut crop is new in this region. However, the area under groundnut in Konkan has increased enormously. The upland early duration rice varieties are being replaced with groundnut cultivation due to poor yield in rice. The Konkan strip having so many tourist spots provide heavy scope for hand-picked and selected (HPS) grade groundnut kernels.

Agro-ecological Regions of Groundnut Farming in India

Groundnut is adapted to varying agro climatic conditions and soils. About 75 % of the groundnut area lies in a low to moderate rainfall zone with a short period of distribution. In India it is primarily grown in rainy *kharif* season (June/July to September/October) under rainfed conditions, which accounts for 83% of the total area under this crop in the country. Remaining 17% of the area is cultivated mostly in the post-rainy *rabi* summer season (October/November to March/April) with irrigation or on residual soil moisture. Though management practices of the crop have improved in recent years and the declining trend in yield has been arrested, however, there are wide fluctuations in yield due to rainfall and soil factors.

Groundnut varieties recommended for Maharashtra

About 60 % of the groundnut area in Maharashtra is under Spanish bunch varieties, which is confined to the northern parts of the state in the regions of Khandesh. In the Marathwada region, Osmanabad and Beed districts Virginia Runner type varieties are grown in *kharif* with red gram, sorghum or sunflower because these two districts get rains from both Southwest and Northeast monsoons. In parts of Ahmednagar, Pune and Solapur districts, the crop is sown in March/April and harvested in August. In Jayakwadi command area (Aurangabad and Beed districts) only Virginia Runner varieties are preferred and crop rotation of groundnut (March-October) and wheat (November-February) is practiced. In Konkan region during *kharif* season Virginia runner type while in *rabi* and summer season both Spanish bunch and Virginia bunch cultivars are grown. In Maharashtra, SB-XI, Kopargaon-1, AK-159, JL-220, JL-286, JL-501, AK303, Ak-365, Ratneshwer, TLG-45, TAG-24, DH-86, Kadiri Harithandra, TKG-Bold and Konkan Gaurav groundnut varieties are commonly grown.

Groundnut Cultivation practices in Raigad district particularly in Konkan region

Climate

For groundnut favourable temperature range is 21-27°C during crop growth period. However, minimum temperature below 18°C at sowing and excess of 35°C reduce germination and flower initiation. Average rainfall of about 700-1000 mm is useful to the crop. The region is characterized with high altitude and humid, sub-humid as well as dry temperature. It has high rainfall (3000-3500 mm), mostly influenced by Southwest monsoon with 80% precipitation in June- September months. The low temperature during middle of crop growth might reduce the growth and yield during *rabi* season. However, polythene mulch technology offsets the low temperature effect and has shown the potential for *rabi* groundnut in Raigad district particularly in Konkan.

Soil properties

North Konkan zone consists of Raigad, Thane and Palghar districts. The soil is coarse in texture with yellowish red to medium black in colour and 7.5-12.5 cm soil depth with high water holding capacity. These soils show high organic matter (2-3%) and organic carbon (1.5-3.0%), with medium pH i.e., 4.5-6.5 and electric conductivity of 0.23 dS m⁻¹. So, all these condition favour groundnut cultivations. The red lateritic soils having low pH can be kept under control by use of soil amelioration. These soils are porous, have low moisture retention capacity and provide ambient conditions for growth and development of groundnut. As soils are porous, excessive irrigation and drainage is not problem in this type of soil.

Suitable varieties/cultivars

During *kharif* season, Virginia type groundnut cultivars are grown as they have fresh seed dormancy. However, in *rabi* and summer season both Spanish bunch and Virginia bunch groundnut cultivars are grown. The runner type being longer in duration and sensitive to high temperature are not suitable to grow during both conditions in Raigad district particularly in Konkan.

The Konkan Bhuratna, Konkan Gaurav and Konkan Trombay Tapura (TKG-Bold) are groundnut varieties recommended for cultivation in Konkan. Konkan Bhuratna is Erect type variety. Crop matures in 115-120 days in *kharif* and 125-130 days in *rabi*. It is suitable for both the seasons as it has fresh seed dormancy of 30 days. It has 76-80 % shelling out-turn and near about 50 % oil content. Its yield potential is about 20-22 q ha⁻¹. It is developed by DBSKKV, Dapoli in 2017. Konkan Gaurav is semi spreading type. Crop matures in 105-120 days in *kharif* and 120-130 days in *rabi*. It is suitable for both the seasons as it has fresh seed dormancy of 30 days. It has 75-77 % shelling out-turn and 49 % oil content. Its yield potential is about 18-20 q ha⁻¹. It is developed by DBSKKV, Dapoli in 1990. Konkan Trombay Tapura is semi spreading and bold variety, matures 115-120 days and is suitable for *rabi* season. It also has fresh seed dormancy of 25-30 days with high protein percent and is suitable for table purpose. It has 68-70% shelling out -turn and 47-49% oil content. Its yield potential is about 20-22 q ha⁻¹ and developed in collaboration with BARC, New Mumbai and DBSKKV, Dapoli in 1993.

Seed rate, spacing and sowing

Medium tillage practice followed by harrowing is very useful for groundnut cultivation. Before last harrowing Farm Yard Manure @ 10 t ha⁻¹ or Vermicompost @ 5 t ha⁻¹ incorporated into the soil and soil is leveled. For higher yield, pure and certified seed is recommended. Seed rate vary for variety i.e., for bold varieties it is 120- 125 kg ha⁻¹, for medium bold 100 kg ha⁻¹ seed and for small seed size it is 80-100 kg ha⁻¹. Seed treatment with carbendazim/Captan @ 2.5 g kg⁻¹ of seed or Thirum 5 g kg⁻¹ seed before sowing to control wilt or other seed borne disease at initial crop growth stage. For healthy crop growth and easy availability of nutrients from chemical fertilizers, seed is treated with Symbiotic Nitrogen fixers like, Rhizobium or Phosphorus Solubilising Bacteria (PSB) @ 25 g kg⁻¹ of seed. Rhizobium treatment increases number of nodules on root and enhance rate of atmospheric Nitrogen fixation and yield upto 10-15%. While, PSB seed treatment solubilize soil phosphorus and make available to plants.

Optimum sowing time

Kharif groundnut is sown in the first fortnight of June after monsoon showers. While, in part of Sindhudurg district it is done after rice planting i.e., in the month of July. If sowing is delayed after 15th July, reduction in yield is observed. In *rabi*, groundnut is also sown from 15th November to 15th December while in summer from 15th January to 15th February. Due to low disease pressure and more sunshine hours, *rabi* and summer crops produce 1.5 to 2.0 times more yield than the *kharif* crop.

Sowing methods

Majority of farmers follow groundnut sowing on flat bed in Raigad. However, sowing on flat bed reduces the groundnut yield because Virginia bunch varieties are semi spreading and most of pegs remain on top soil which affects pod development. Traditionally, farmers sow groundnut behind the wooden/country plough with 30-45 cm row distance. In this method plant to plant distance is not

maintained and yield reduction due to insufficient plant stand. Hence, the improved methods of groundnut cultivation like Broad Bed and Furrow (BBF) and polythene mulching technology are recommended by DBSKKV, Dapoli.

Broad Bed and Furrow or ICRISAT method

This method is developed by International Crop Research Institute for Semi-Arid Tropics, Hyderabad (ICRISAT) and very suitable for Konkan region due to high rainfall zone. In this method beds of 1.2 m width and 15-20 cm height with suitable length (depending on slope) are prepared. The distance between two beds is 30 cm. Groundnut is sown in 5 rows on each bed with 30 cm row spacing while plant to plant 10 cm distance is maintained. This method requires normal seed rate of 120-125 kg ha⁻¹.

Polythene mulching Technology

Nowadays polythene mulching technology is new emerging technology in Konkan region particularly in *rabi* season. In *rabi* season, soil temperature below 18°C hampers seed germination in such case polythene mulching is desirable which increases the soil surface temperature about 5-6°C and also reduces crop growth period (8-10 days) and ensures that water will be available to entire crop growth period, as water availability is problem in some areas after month of April. The bed is formed with 90 cm base width, 60 cm top width and 8-10 cm height. The distance between two beds is kept 30 cm. Plastic film having 5-7-micron thickness is used for mulching which facilitates easy peg penetration in to soil through film. About 55 kg white transparent polythene mulch having 90-100 cm width is required for one-hectare mulching. Before mulching the holes of 3-4 cm are prepared by zigzag means with keeping of 20 cm row space and 10 cm for plant spacing. Likewise, each bed consists 3 rows (20 cm) of groundnut with 10 cm plant spacing.

Also, prior to groundnut sowing under polythene mulching all recommended fertilizer dose and weed management practices are followed to keep weeds under control. Two groundnut seeds are placed in each hole, therefore this method required nearly double seed rate i.e., 200-220 kg ha⁻¹. Mulching prevents direct soil moisture evaporation and limits water losses by conserving moisture which reduces 2-3 irrigations. It acts as barrier to soil pathogens and nematodes, suppress weed and develop a microclimate underside of the sheet with increased microbial activity desirable for groundnut. The pegs arrived at later stage are weak and unable to penetrate plastic film hence, better pods with synchronous maturity and increased oil and protein percent with yield. Polythene mulch technique is new way to get higher returns, and DBSKKV, Dapoli recommended to grow *kharif* groundnut on BBF at 80 - 20 cm using 7 microns 44 kg ha⁻¹ transparent polythene mulch for higher yield and economic returns [10]. It was seen from the OFT's FLD's as well as Result demonstrations under National Mission On Oilseed Project, Cluster Front line Demonstrations conducted by Krishi Vigyan Kendra, Roha Raigad at village level particularly Mahad, Aakale, Aasanpoyi, Poladpur, Devale, Nilaj (Dharmachi Wadi), Indapur, Pali, Roha, Killa on sowing of Groundnut with transparent Polythene mulch, participating farmers got on an average 35 to 40 Q/ha Pod yield of Groundnut, which is 35 - 40 % higher compared to sowing Groundnut without Polythene.

Earthing up operation

In Raigad district groundnut cultivation is done on flat bed which results in poor yield. The main reason is semi spreading groundnut varieties have lateral pegging and all pegs do not enter soil and are unable to produce pods. Therefore, to avoid this loss, earthing up operation is necessary on flat bed sowing. Earthing up is carried out by 'Swastik implement' developed by DBSKKV, Dapoli. The groundnut grown on BBF does not require earthing up operation.

Fertilizer and nutrient management

The recommended fertilizer dose for groundnut cultivation in Konkan is 25:50:00 kg NPK ha⁻¹. However, groundnut meets its 60-80 % Nitrogen requirement from symbiotic nitrogen fixation by root nodules and only 20-40 % by soil nitrogen. Therefore, Nitrogen supply to groundnut has played crucial role and its deficiency is observed between 10-45 DAE and at pod formation stage.

So that, 25 kg Nitrogen be applied through external sources, the half at the start of the cultivation as basal and half at pod filling as booster (top dressing) dose. The Spanish and Virginia bunch groundnut, has lesser crop duration and nitrogen fixation response, therefore more addition of external nitrogen than the Virginia runner. Also, majority of farmers apply whole quantity of fertilizers at sowing which reduces the fertilizer use efficiency. OFT's, FLDs conducted by Krishi Vigyan Kendra, Roha, Raigad showed that split application of nitrogen in groundnut resulted in significant effect on pod yield of groundnut. Therefore, 100% RDF (25 kg N + 50 kg P₂O₅) at the time of sowing and 50% RDF (12.5 kg N + 25 kg P₂O₅) as top dressing at 30 DAS is recommended for profitable groundnut yield [11-13]. The phosphorus requirement is high in groundnut which promotes plant growth, enhances pod filling, shelling percentage and crop yield. The recommended phosphorus to groundnut is 50 kg ha⁻¹ and total quantity is applied as basal dose in Konkan. Moreover, higher availability of soil potassium (K₂O) does not need its soil application.

Red lateritic soils are acidic and deficient in micronutrients, particularly, B and Mo deficiency while, Fe and Mn availability at toxic levels are observed. Deficiency of B causes hollow heart of kernel in which inner faces of cotyledons are depressed and discolored reducing the quality of groundnut seed with half pod filling and less shelling. Hence, soil application of 1 kg B ha⁻¹ and 20 kg Zn through ZnSO₄ is advisable to correct the B and Zn deficiency. However, result demonstrations conducted by Krishi Vigyan Kendra, Roha, Raigad showed that application of 20 kg ZnSO₄ ha⁻¹ along with recommended dose of fertilizer (25 kg N + 50 kg P₂O₅) gave higher pod yield in Konkan region [3].

Weed management

Severe problem of weed infestation occurs in Konkan region during *kharif* season due to heavy rainfall. However, comparably less weed flora observed in *rabi* season. The monocot weeds are *Digitaria sanguinalis*, *Echinochloa crusgalli*, *Oryza sativa*, *Cynodon dactylon*, *Cyperus defformis* and *Eleusine indica* are dominating in Konkan except *Cynodon dactylon*. However, in dicot weed *Cleome viscosa*, *Convolvulus arvensis*, *Leucas aspera*, *Amaranthus* spp., *Eclipta prostrata*, *Alternanthera sessilis*, *Euphorbia hirta* and *Physalis minima* are dominated except *Cleome viscosa*, *Convolvulus arvensis* in Konkan.

The weeds are more competitive in removing plant nutrients from the soil, twice as much N, 24% more K and twice more Ca than groundnut plants, and thus, deprive the crop from optimum nutrient uptake and increase the total nutrient requirement of groundnut crop. The critical period of weed competition in groundnut varies with soil, climate, crop cultivar and weed species and has been reported from 4 to 8 weeks [4,5]. Virginia cultivars reduce weed growth more than Spanish cultivars, and in Spanish cultivars the critical period was found to be 35 DAS, whereas, in Virginia cultivars it was 45-60 DAS [6]. Intercropping systems reduce weed competition period as compared to sole groundnut. In groundnut + pigeon pea intercropping, the critical period of weed competition was between 2 and 8 weeks [7]. In general, the maximum period of weed competition that can be tolerated by groundnut crop without any adverse effect on yield is around 30 DAS.

For weed control in groundnut, first hoeing at 15 days after sowing is followed by two subsequent hoeing at 15 days intervals with 1-2 weeding keeping crop weed-free up to 30 days after sowing. Under some circumstances like rain or others, if this practice is not followed then, OFT's, FLDs conducted by Krishi Vigyan Kendra, Roha, Raigad recommended that pre-emergence application of Pendimethalin @ 1 kg ha⁻¹ combined with one hand-weeding at 30-35 days after sowing. If hand-weeding is not possible, pre-emergence application of Pendimethalin @ 1 kg ha⁻¹ be combined with post emergence application of either Quizalofopethyl @ 50 g ha⁻¹ or Imazethapyr @ 75 g ha⁻¹ are used for effective and profitable weed control. Also, under resource constraints, give first preference to fertilizer management followed by weed management and plant protection measures, respectively for obtaining higher productivity and profit from *kharif* groundnut [8,9].

Cropping system

In Konkan region, it is recommended to apply 25 kg N + 75 kg P₂O₅ ha⁻¹ to groundnut and 75% RDF (75 kg N + 37.50 kg P₂O₅ + 37.50 kg K₂O ha⁻¹) to rice for getting higher yield and economic returns from *rabi* groundnut-*kharif* rice system.

Irrigation

The red lateritic soils are dominated by kaolinitic clay minerals which have low cation exchange capacity and low moisture retention capacity. They are also very porous with good drainage and better permeability to water and air. On account of low moisture retention capacity, they require small amount of irrigation at short intervals.

Konkan region is high rainfall zone and *kharif* groundnut is completely rainfed but, *rabi* season requires 70-80 cm irrigation water for successful cultivation. The flood irrigation method has low water use efficiency (40-45%), ridges and furrow (60-70%) while, sprinkler irrigation gave 65-85% water use efficiency which also save 35% water with increased yield upto 25%.

Amount of water applied to critical growth stages is also very important. If sufficient water is not available at critical growth stages there is drastic yield reduction. For groundnut branching to 50% flowering (35-50 days) and 50% flowering to pod development (50-70 days) are critical growth stages and if sufficient water not available pod remains small and reduced seed size and ultimately affect yield. Depending on soil type and crop growth period irrigation interval is also managed. Crop growth period in February-March has 10-12 days interval and April-May-June is 8-10 days. However, medium to heavy soils of North Konkan require 10- 12 days interval while, red lateritic light soils of south Konkan zone require 7-8 days of irrigation interval.

Pest and Disease management

Insect and pests

The aphids, jassids and thrips are sucking pests while leaf minor, leaf eating caterpillar, white grub and termites are major pests in Konkan. These can be controlled by proper remedial measures as, spray Dimethoate 30 EC @ 500 ml or Monochrotophos 36SL @ 700 ml or Methyldemeton 25 EC or Cypermethrine 20 EC 200 ml 500 ml or quinalphos 25 EC @ 750 ml or 50% WS Carbaryl powder @2kg in 500 lit ha⁻¹. Soil drenching of quinalphos 5 lit or phorate 10G or carbofuron 3G 25 kg ha⁻¹ is preferred for white grub and termite control.

Diseases

Tikka, rust, bud necrosis and root rot are major diseases observed in Konkan region in groundnut cultivation. For control of diseases, seed treatment with Thirum 5 g ha⁻¹ or 2.5 g kg⁻¹ of seed and spraying at flowering and each 15 days interval for two times with Mancozeb 25 g or Carbendazim 10 g or Propiconazol 10 ml liter⁻¹ or sulphur 25 g or 5 ml Tridemorf lit-10 water is followed. *Aspergillus flavus* causes post-harvest fungal disease, Aflatoxin which grows inside the groundnut seed. Aflatoxin contaminated seed are shriveled covered by yellow or greenish spores, unsuitable for eating. To avoid aflatoxin contamination, during harvesting less breakage of pods or broken pods processed separately, pods are sun dried for 5-6 days and stored in dry place in perforated bags without water contact.

Harvesting and storage

As groundnut is an indeterminate crop, hence synchronous maturity of its pods cannot be obtained. Therefore, harvesting should be done when 75-80% of pods are mature. The important indications of maturity are yellowing leaves, necrotic spotting on leaves, dropping of old leaves, pods become very hard and tough, they give cracking sound when split open with fingers, the inside of the shell turning dark, with netted venation, seed coat develops pink or red colour (normal color of the varieties) is observed.

Generally harvesting is done by pulling or lifting the plants from the soil with pods intact. If soil moisture is adequate, then hand pulling is practiced. If soil is dry, tractor or bullock drawn blades are used for lifting the vines with pods. Harvesting before maturity reduces yield and oil percentage and seeds are highly susceptible to aflatoxin. If delayed, results in increased incidence of stem rot. The most common method is stripping pods with hand, but it is tedious and time consuming and labour-intensive method. However mechanical stripping of pods saves manpower and time also. At the time of harvest, pods usually have moisture content around 40-50% and need to be dried upto 10% moisture content for safe storage. Sun drying is the usual method of drying.

Pods for seed purpose are stored in earthen pots, mud bins or bamboo baskets or Gunny bags having polythene lining. If the seed moisture content is above the critical level of 9-10%, then aflatoxin is produced due to *A. flavus*.

Success stories of groundnut farmers in Raigad district of Konkan

Success stories of some groundnut growing farmers in Konkan region those who have been getting bumper pod yield by adapting packages of practices given by Krishi Vigyan Kendra, Killa - Roha, Tal Roha, Raigad under Dr. BSKKV Dapoli, Ratnagiri.

1. Shri. Tukaram Shankar Deshmukh, A/P. Nadgaon, MIDC, Mahad

Shri. Tukaram Shankar Deshmukh of village Nadgaon, Tal. Mahad, Dist. Raigad was one of the beneficiary farmers of the FLD conducted during *rabi* 2013-14. He was a marginal farmer having land of 0.60 ha for seasonal crops. Before the sowing of FLDs, the farmer's training was conducted for providing guidelines regarding implementation of groundnut FLDs. He conducted the demonstration under supervision of the scientists of the Krishi Vigyan Kendra, Killa - Roha. He applied total 8 irrigations to the demonstration plot from farm well using electric lifting pump facility available at his farm. At the time of harvesting, he got 3005 kg ha⁻¹ pod yield and 3107 kg ha⁻¹ haulm yield from improved variety of groundnut TKG Bold as against 2754 kg ha⁻¹ pod yield and 2786 kg ha⁻¹ haulm yield from the local check. It was 17.5 percent higher net returns from the improved variety (Rs. 58476 ha⁻¹) over the local check (Rs. 49747 ha⁻¹) with B:C ratio 1.78 from improved variety and 1.70 from local check. He was satisfied by the yield obtained from his demonstration plot. The effect of this demonstration was positive. Though the groundnut crop is new for this region, neighbouring farmers were inspired by the success of FLD plot of Shri. T. S. Deshmukh.

2. Shri. Pramod Dhondiba Jadhav

Shri. Pramod Dhondiba Jadhav of village Nilaj, Dhamachi Wadi, Indapur, Tal. Mangaon was one of the beneficiary farmers of the FLD conducted during *Rabi* 2013-14. He was a marginal farmer having land of 0.60 ha for seasonal crops. Before the sowing of FLDs, the farmer's training was conducted for providing guidelines regarding implementation of groundnut FLDs. Total 30 kg seed of improved variety 'Trombay Konkan Tapura' was supplied to him for an area of 0.20 ha. He conducted the demonstration under supervision of the scientists of the Krishi Vigyan Kendra, Killa - Roha. All the package of practices recommended by the University was followed by him. He applied total 12 irrigations to the demonstration plot from farm well using electric lifting pump facility available at his farm. At the time of harvesting, he got 3342 kg ha⁻¹ pod yield and 3712 kg ha⁻¹ haulm yield from improved variety of groundnut TKG Bold as against 2835 kg ha⁻¹ pod yield and 2774 kg ha⁻¹ haulm yield from the local check. It was 49.6 percent higher net returns from the improved variety (Rs. 66967 ha⁻¹) over the local check (Rs. 44763 ha⁻¹) with B:C ratio 1.83 from improved variety and 1.60 from local check. He was satisfied by the yield obtained from his demonstration plot. The effect of this demonstration was positive. Though the groundnut crop is new for this region, neighbouring farmers were inspired by the success of FLD plot of Shri. Pramod Jadhav.

3. Shri. Satyawar Dhondur Kadam

Shri. Satyawar Dhondur Kadam of village Phalakewadi, Raigad was one of the beneficiary farmers of the FLD conducted during *kharif* 2013. He was a marginal farmer having land of 0.80 ha for seasonal crops. Before the sowing of FLDs, the farmer's training was conducted for providing guidelines regarding implementation of groundnut FLDs. Total 30 kg seed of improved variety 'Trombay Konkan Tapura' was supplied to him for an area of 0.20 ha. He conducted the demonstration under supervision of the scientist of the Krishi Vigyan Kendra, Killa - Roha. All the package of practices recommended by the University was followed by him. At the time of harvesting, he got 3725 kg ha⁻¹ pod yield and 4800 kg ha⁻¹ haulm yield from improved variety of groundnut TKG Bold as against 3325 kg ha⁻¹ pod yield and 3800 kg ha⁻¹ haulm yield from the local check. It was 49.8 percent higher net returns from the improved variety (Rs. 75982 ha⁻¹) over the local check (Rs. 50720 ha⁻¹) with B:C ratio 1.92 from improved variety and 1.71 from local check.

He was satisfied by the yield obtained from his demonstration plot. The effect of this demonstration was positive. Though the groundnut crop is new for this region, farmers in their vicinity area were inspired by the success of FLD plot of Shri. Satyawar Kadam.

4. Shri. Baban More

Shri. Baban More, of village Mohot, Poladpur, Raigad was one of the beneficiary farmers of the FLD conducted during *kharif* 2015. He was a marginal farmer having land of 0.60 ha for seasonal crops. Before the sowing of FLDs, the farmer's training was conducted for providing guidelines regarding implementation of groundnut FLDs. Total 36 kg seed of improved variety 'Trombay Konkan Tapura' was supplied to him for an area of 0.24 ha. He conducted the demonstration under supervision of the scientist of the Krishi Vigyan Kendra, Killa - Roha. All the package of practices recommended by the University was followed by him. At the time of harvesting, he got 2450 kg ha⁻¹ pod yield and 2725 kg ha⁻¹ haulm yield from improved variety of groundnut TKG Bold as against 1800 kg ha⁻¹ pod yield and 2200 kg ha⁻¹ haulm yield from the local check. It was 78.2 percent higher net returns from the improved variety (Rs. 62762 ha⁻¹) over the local check (Rs. 35616 ha⁻¹) with B:C ratio 2.56 from improved variety and 1.86 from local check. He was satisfied by the yield obtained from his demonstration plot. The effect of this demonstration was positive. Though the groundnut crop is new for this region, Nearby Farmers were inspired by the success of FLD plot of Shri. Baban More.

Summary

Groundnut is successfully cultivated in villages of Raigad district of Konkan region. The use of packages of practices recommended by DBSKKV, Dapoli showed positive effect on groundnut yield. Though it is emerging crop for Konkan compared to rest of Maharashtra, it is gaining popularity. Now a day's rice - groundnut is one of the profitable cropping systems in Konkan region with higher economic returns. Success story of different groundnut growing farmers viz., Shri. Gaikwad, Shri. Deshmukh, Shri. Jadhav and Shri. Kadam recorded highest yield with TKG Bold variety by adoption of recommended package of practices given by DBSKKV, Dapoli.

Application of research: Article highlighting whole package of practices along with suitable success stories definitely motivate other farmers to adopt this technology and maximized production.

Research Category: Agriculture Extension

Abbreviations: ha⁻¹-Per hectare, N-Nitrogen, OFT's-On farm Trial
FLD's-Front line Demonstration, BBF-Broad Bed Furrows
B-Boron, Mo-Molybdenum, Zn-Zinc, K₂O- Potassium oxide
RDF-Recommended dose of Fertilizer, DAE-Days after emergence
P₂O₅- Phosphorus pentoxide, K-Potassium, EC-Emulsifiable concentration

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Study area / Sample Collection: Raigad District of Maharashtra State

Cultivar / Variety / Breed name: Groundnut Crop

Conflict of Interest: None declared

Ethical approval: This article does not contain any studies with human participants or animals performed by any of the authors.

Ethical Committee Approval Number: Nil

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