Fenugreek (Trigonella foenum-graecum L.) is an annual spices herb of the subfamily Papilionaceae of Leguminaceae family. It is small seeded self pollinated, diploid annual legume plant with chromosome number 2n= 16. It is an important non spices used as a potential source of deosgenin. Fenugreek is also known as one of the oldest medicinal plants recognized in the recorded history.

Fenugreek has two centers of origin, the Indian sub-continent and the Eastern Mediterranean Region. Fenugreek is considered to have originated in the Mediterranean region of the “Old World” (Vavilov, 1926) or in parts of Asia (De Candolle, 1964). The spices name “foenum-graecum” means “Greek hay” indicating its use as a forage crop in the past. Fenugreek is widely cultivated in warm temperate and tropical region of the Mediterranean, Europe and Asia. Fenugreek is cultivated worldwide under semi-arid agro-climatic conditions having potential to fix atmospheric nitrogen and tolerant to mild salinity (Habib et al., 1971).

India is popularly called as “The land of spices”. From ancient times, India is regarded as the home of cultivated spice crops. India is the largest producer, consumer and exporter of spices in the world. The seed spices are group, which denotes all those annuals whose dried fruit or seeds are used as spices. The seed spices are aromatic vegetable products of tropical region mostly used in pulverized state, primarily for seasoning or garnishing food and beverages. They are characterized by pungency strong odour and sweet or bitter taste. Gujarat and Rajasthan states have emerged as “Seed Spices Bowl” and together contribute more than 80 % of the total seed spices produced in the country. While other states where spices commonly grown are Haryana, Punjab, Madhya Pradesh, Maharashtra, Bihar, Uttar Pradesh, West Bengal, Orissa, Tamil Nadu and Karnataka.

Generally fenugreek is raised as a rabi season crop and is fairly tolerant to frost and low temperature. It can be successfully grown in all types of soils under irrigation conditions, but does best in loamy soils. Fenugreek can also be grown in black cotton soils where it is possible to take a second crop in the same field (Guru, 1988).
Fenugreek is the third highest seed spice in India (after coriander and cumin). This is one of the oldest cultivated plants. It was a part of Indian diet even 3000 years ago. Fenugreek seeds are rich in essential amino acids and trigonelline for which it is valued for medicinal uses. A potential use of fenugreek is for extraction of sapogenin and diosgenin (a steroid precursor) which is used as oral contraceptives (Elujoba and Hardman, 1988) and for production of corticosteroid. The seeds of fenugreek are used as spice due to its pleasantly bitter taste and peculiar odour and flavour and mainly used as condiment and generally found in most blends of curry powder, spices and meat products. Seeds are bitter in taste due to the presence of two alkaloids “Trigonellin” and “Choline”. As the seeds are digestive, carminative, astringent, diuretic and tonic they are used in many medicines which is being used in chronic dysentery, diarrhoea, chronic cough, enlargement of liver and spleen, while young plants are used as a vegetables and forage. Since long, fenugreek has been used in cosmetology, mucilage and oleoresins obtained from fenugreek are also in large demand.

The use of fenugreek is multipurpose. Fenugreek being a leguminous crop, fixes a good amount of nitrogen. Its seeds are used as condiments and vegetable for human consumption and as a concentrate for cattle. The seeds are aromatic, tonic and galactogogue, so it is widely used as medicinal plant. It green leaves are used as vegetable, while chopped leaves are mixed in flour to prepare delicious preparation. Being a legume, its roots are endowed with a mini-factory to synthesize nitrogenous food for the plant. (Agrawal et al., 2001).

In India this crop is grown on area of about 50,400 ha with the production of about 62,800 tones and productivity 1245 kg ha⁻¹. Rajasthan enjoys as special status in fenugreek production. In 2016-17, Gujarat produced 14166.79 tonnes of fenugreek from an area of 7042 ha with the productivity of 2011.75 kg ha⁻¹ which is the highest in the country. The major districts are Patan, Anand, Dahod, Banaskantha and Vadodara. (Anon., 2017).

It is largely cultivated in Argentina, Egypt, Brazil, Southern France, Morocco, Algeria, Ethiopia and Lebanon besides India. The major seed producing countries are India, Ethiopia, Egypt and Turkey. India is the one of the major producer and exporters of fenugreek. Fenugreek is exported to Saudi Arabia, Japan, Malaysia, USA, UK, Singapore and Sri Lanka. This spices occupies third place in area and
fourth in producing among all the major seed spices grown in the country.

Fenugreek is a important cool season spices grown for leaves and seeds. Fenugreek has a various culinary uses. Fenugreek is shown to help with numerous health issues. Some health benefits of fenugreek are as follows. Improves digestive problems and cholesterol levels, reduces inflammation inside the body, promote milk flow in breastfeeding, lowers inflammation from outside the body, add flavor and spices to food, helps with eating disorders.

Fenugreek plants are week spreading moderately branched attaining a height of 30 to 50 cm. flowers in 30 to 50 days after sowing and matures in 110 to 140 days. Chemical analysis of Fenugreek seed revealed that it contains 13.7 percent water, 26.2 percent protein, 5.8 percent fat, 3.0 percent mineral matter, 7.2 percent fibers, 4.41 percent carbohydrates, 0.16 percent calcium, 0.37 percent phosphrous, 14.1 mg iron, 333 calories and 160 IU carotene per 100 gm. (Agrawal et al., 2001). The maximum diosgenin 2.03 per cent was found in cotyledons of germinated seeds of fenugreek (Bhavsar et al., 1980).

Phosphorus is required for nitrogen metabolism and hence for synthesis of protein. It play important role in energy transfer. It involve in a wide range of process from cell division to the penetration and development of root system. It is a constitute of ADP and ATP which are the most important substances in plant life process.

Sulphur plays an important role in enhancing the productivity and quality of legumes by providing proper nutritional environment in the soil. Sulphur being the constituent of some amino acids, promotes the biosynthesis of protein. Application of sulphur is a key component of modern pulse production technology. The importance of sulphur in balance plant nutrition is realized with increasing sulphur deficiency in several areas due to intensive agriculture, less addition of organic manures and extensive use of sulphur free fertilizers.

The judicious use of phosphorus and sulphur fertilizer in crop land result in increase growth, yield, nutritive quality and soil fertility. Especially its nutritive requirements for fenugreek in medium black calcareous soil of Saurashtra region in rabi season is low to medium. At present area of fenugreek increase in Saurashtra region.

However, the research on phosphorus and sulphur in fenugreek is low to medium in Saurashtra region of Gujarat. To decide as well as to evaluate the potential
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productivity of fenugreek in Gujarat state through phosphorus and sulphur need of research and eventually for benefit to farmer. Keeping all these points in view, the present research work entitled, “Response of fenugreek (*Trigonella foenum-graecum* L.) to phosphorus and sulphur” was undertaken at the Instructional Farm, Junagadh Agricultural University, Junagadh during *rabi* season of 2016-17 with the following objectives.

Objectives

1. To study the effect of phosphorus on growth, yield and quality of fenugreek.
2. To find out the effect of sulphur on growth, yield and quality of fenugreek.
3. To ascertain the interaction effect of phosphorus and sulphur on growth, yield and quality of fenugreek.
4. To arrive an economically viable conclusion for fenugreek.