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Faba bean (*Vicia faba* L.): A Potential Multipurpose Legume Crop

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INTRODUCTION

Faba bean also known as broad bean, fava bean is a multipurpose short-duration grain legume crop grown in the cool season. The faba bean belongs to fabaceae family which consists of various legumes crops. South Caspian Sea and North Africa are widely assumed as centres of origin for faba bean (Tanno and Willcox, 2006). Faba bean is a potential multipurpose crop used for both food and fodder (hay, silage and straw) that can grow to a height of 1.5-2 m. Faba bean is believed to be one of the ancient crops in domain (Singh *et al*., 2013) with a prolonged tradition of cultivation in the temperate zone of Northern Hemisphere (Due *et al*., 2015). Faba bean is known by different names in different parts of the world such as Bakela in Ethiopia, Faveira in Portugal, Fulmasri in Sudan, Kala matar & Bakla in India, Fava bean, Horse bean, Windsor bean, Broad bean, etc. in some other parts of the world.

Area, Production and Productivity:

Globally, the total area under faba bean in 2014, was 2.43 million hectares producing 4.4 million tonnes of grain with average productivity of 1807 kg/ha. In 2014 faba bean share in the total area under cultivation of pulses was 2.9%, contributing 5.7% in total production of pulses globally (FAO, 2019).

Fig: Faba bean plant at pod formation stage.
Source: Muktadir MA *et al.*,2020

Globally, faba bean is mainly produced in China, Australia, Europe, Northern Africa and West Asia. China is the largest producer amounting to 60% of global production (FAO, 2019). In North Africa and parts of West Asia, faba bean is a preferred pulse, but in India, it is categorized as potential legume. In India it is mainly grown in Bihar, Uttar Pradesh, Odisha and Madhya Pradesh, Bihar being the largest cultivator (Singh *et al*., 2012).

Nitrogen Fixation Capabilities:

It has been recognized for its efficient biological nitrogen fixation capabilities which is maximum amongst cool season grain legumes (Mekkei, 2014). Studies show that it can fix 50-330 kg N ha^{-1}. The faba bean grown as a cover crop reduced the fertilizer requirement of subsequent maize crop by half the amount needed compared to maize grown without faba bean as cover crop, while increased the yield significantly (Etemadi *et al*., 2018)

Nutritional Value:

It is rich in minerals, proteins, dietary fibre, complex carbohydrates, lecithin, choline & secondary metabolites. The nutritional composition of faba bean consists of approximately 0.1 g fat, 4.5 g protein, 7.2 g carbohydrate, 50 mg calcium, 0.08 mg thiamine, 1.4 mg iron, 12.0 mg ascorbic acid per 100 g edible part. Faba bean seeds are a valuable source of protein and energy for animals since they are high in protein (25-33 percent DM) and starch (40-48 percent DM). They have a significant amount of fibre (crude fibre 7-11 percent DM). Fresh faba bean fodder is of good quality, with protein levels ranging from 14 percent to more than 20 percent dry matter (DM). Protein content is maximum during full flowering and falls after that (Alibes *et al*., 1990). In ruminants, faba bean seeds are highly digested (OM digestibility: 91%) and are equivalent to peas (Micek *et al*., 2012).

Potential Uses:

- High potential for soil fertility improvement being a good biological nitrogen fixer.
- Potential source of fodder for livestock due to high palatability of fodder.
- Good source of protein and energy for animals
- Nabet soup (boiled germinated grains), Medamis (roasted salty beans), Bissara and Falafel (spices & vegetables mixed with deep-fried cotyledon paste) are popular faba bean dishes
- It also has great therapeutic potential, as it contains a large amount of L-3, 4 dihydroxyphenylalanine (L-DOPA), a precursor to neurotransmitter catecholamine used to treat Parkinson's disease (Etemadi *et al*., 2018).
- Its incorporation in the cropping system has a great potential for achieving diversification of the cropping system.

Anti-nutritional contents:

The presence of some anti-nutritional elements such as phytic acid, saponins, α-galactosides, protease inhibitors, convicine, vicine, glucosides, and hemagglutinins has hindered the large-scale adoption of this grain legume. However, pre-soaking and hot water treatment may lower anti-nutritional values in faba bean (Batra *et al*., 1990).

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