



Weed Control for Winter Faba Bean Cover Crop in South Florida¹

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Introduction

Faba bean (broad or horse bean), *Vicia faba*, is an important leguminous winter crop in warm temperate and subtropical areas. Native to the Near East and the Mediterranean basin, faba bean has been cultivated for more than 10,000 years and is used primarily as a source of protein in human and livestock diets. It is also grown for green manure, which can be used to considerably enhance yields of other crops. Faba bean provides nitrogen in agricultural systems through the unique process of biological fixation of atmospheric nitrogen by symbiosis with *Rhizobium* bacteria. This substantially reduces the need for nitrogen fertilizers, which contribute to both carbon dioxide and nitrous oxide emissions. Faba bean also maintains high rates of biological nitrogen fixation in the presence of high amounts of available soil nitrogen in contrast to other legumes. Faba bean can grow up to 7 feet tall at maturity. Stems are erect with taproots that bear a profusion of fibrous roots in the top 12 inches of the soil. Leaves are compound with 2 to 7 leaflets. Comprised of 3 to 8 flowers, the inflorescence is

borne from the 5 to 7th leaf-bearing stem node up to the highest node.

Cover crop

Cover crops encompass a wide range of plants, including faba bean, and they are grown for various ecological benefits other than as a cash crop. These plants are grown in rotations during periods when cash crops are not grown. In South Florida, faba bean can be used as a cover crop prior to planting winter vegetables. The main purpose of a faba bean cover crop is to benefit the soil and/or other crops by soil quality improvements, fertility improvements, and erosion control. Establishment and growth of faba bean roots improve the soil tilth and water infiltration into compacted areas. Faba bean adds substantial amounts of available nitrogen to the soil that can be taken up by subsequent crops. Soils in South Florida are prone to wind erosion especially when in fallow. Faba bean cover crops can greatly reduce both wind and water erosion by holding the soil in place before planting the desired crop.

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Weed control

Weed growth in faba bean cover crop can be problematic in South Florida because many weed species germinate year-round in this subtropical environment. Weed seed produced during this period may increase weed management costs in subsequent crops. With mild winters, suppression of weeds species, including *Amaranthus* spp., common lambsquarters, common purslane, goosegrass, and broadleaf panicum, may be more difficult, particularly with faba bean that often does not provide complete ground cover. Weed control in faba bean can be achieved using a combination of cultivation and herbicide programs. If cultivation is used, row spacing that will accommodate frequently used equipment should be used to minimize any adjustments to cultivators.

Preemergence herbicides, such as pendimethalin (Prowl H2O, Prowl 3.3 EC) and s-metolachlor (Dual II Magnum), can be used to provide adequate residual weed control in faba bean cover crop. Pendimethalin can be broadcast applied preemergence to control broadleaf and grass weeds at rates of 3 to 4 pints per acre. The higher rate of pendimethalin should be used when faba bean cover crop is grown on muck soils. Pendimethalin will provide most effective weed control when incorporated into the soil by rainfall, overhead irrigation, or mechanical tillage prior to weed seedling emergence. In addition, s-metolachlor can be used preemergence at 2 to 4 pints per acre to provide control of broadleaf and grass weeds. The use rate of s-metolachlor depends on soil texture and percent organic matter content. Muck soils will require higher rates of s-metolachlor. Over-the-top application of bentazon (Basagran) postemergence at 2 pints per acre can be used to supplement weed control when adequate weed control is not achieved with PRE herbicide treatments. To achieve consistent weed control with bentazon, adjuvants including crop oil concentrate at 1 to 2 pints per acre, urea ammonium nitrate at 4 to 8 pints per acre, and ammonium sulfate at 2.5 pounds per acre should be used. These additives may cause some leaf burn when applications are made under high relative humidity and temperature. However, subsequent new growth is normal and faba bean vigor is not reduced. Generally,

preemergence residual herbicides may not be needed where residues from preceding crops are still effective. But, when using herbicides, plant back restrictions on the subsequent crop have to be followed to eliminate any adverse effects from herbicide residues that might still be present in the soil.

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