Research Paper

Effect of weed management on weeds and nutrient uptake in *Rabi* castor (*Ricinus communis* L.) under South Gujarat conditions

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ABSTRACT

Experimental site constituted by monocot weeds *viz.*, *Echinochloa crusgalli* (L.) Beauv, *Digitaria sanguinalis* L. and Eragrostis major dicot weeds *viz.*, *Amaranthus viridis* L., *Alternanthera sessilis.*, *Digera arvensis* Forsk., *Convolvulus arvensis* L., *Trienthma portulacastrum* L., *Euphorbia hirta* L., *Physalis minima* L., *Eurphorbia mudarosptiensis* and among sedge *Cyperus rotundus* L. Weed free condition and pre-emergence application of pendimethalin @ 1.0 kg a.i./ha + interculturing and hand weeding at 30 DAS and pre-emergence application of pendimethalin @ 1.0 kg a.i./ha + post-emergence application of fenoxaprop-p-ethyl @50 g a.i./ha at 25 DAS were effective in reducing total weed density and dry weight of weeds, weed index and higher weed control efficiency. These treatments recorded significantly highest uptake of N, P and K by crop and lowest uptake by weeds.

KEY WORDS : Herbicides, Castor, Weeds, Nutrient, Uptake

Castor (*Ricinus communis* L.) is valuable non-edible oil seed crop playing an important role in agriculture economy. Castor oil has diversified uses and has great value of foreign trade. Leaves of castor are rich source of protein (23 to 25%) and used for ericulture. Castor cake a byproduct is used as organic manuring. Castor stalks are useful in manufacturing paper, card-board and also widely used as a fuel. Its hull is used as manure after decomposition.

Several measures have been suggested to control the weeds. Hoe and hand weeding on 20th and 40th day of sowing are effective to remove the weeds. Hand weeding and inter-culturing are effective, but always associated with regeneration of weeds and requires frequent operations, which makes this practice sometimes costly and also not feasible all times due to poor soil physical condition and unavailability of labours and implements. In this context, herbicides and other effective methods like mulching can play vital role in management of weeds.

The use of herbicide in crop land, generally results in increase in crop yield, improve crop quality and reduce production cost. Herbicides used alone or in combination with other weed control method reduced the crop-weed competition and the risk of weeds growing in adverse weather or soil condition that would hinder the use of more traditional weed control methods. Alachlor herbicide applied pre-emergence was effective against *Amaranthus* in castor (Chenault *et al.*,1969).

RESEARCH PROCEDURE

A field experiment was conducted during *Rabi* season of 2009-2010 at the College Farm, Navsari Agricultural University, Navsari. Total 9 weed control treatments were assigned in Randomized Block Design with four replications. The castor hybrid GCH 7 was sown at 120 x 60 cm spacing on October 15, 2009 and finally harvested on April 4, 2010. The soil of the experimental field was clayey in texture and showed low, medium and high rating for available nitrogen (219.52 kg ha^{-1}), phosphorus (30.91 kg ha^{-1}) and potassium (387.60 kg ha^{-1}), respectively. The soil was found normal in respect of pH (7.8) and electric conductivity (0.36 dsm^{-1}). Pendimethalin was sprayed next DAS and fenoxaprop-p-ethyl was sprayed on 25 DAS. Follow up weeding operation after herbicide application as per treatment. The crop was grown with standard package of practices for