Studies on seed development and maturation in senna (*Cassia angustifolia*)

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Senna (*Cassia angustifolia* Vahl.) is the second most important medicinal crop of India after *Plantago ovata* L. in terms of export value and Tamil Nadu is the leading senna producing State in India with highest area under the crop. It is grown as a summer (Kharif) crop under north Indian condition for its pods and leaves valued for their cathartic properties. Information on seed development and maturation is lacking in this species. Therefore, an experiment was conducted in the experimental farm of Division of Seed Science & Technology, IARI by growing the crop during kharif season in 2006 with the objectives to determine the time required for seed development and maturation and stages of physiological maturity. The flowers were tagged during flower opening and observations were taken by sampling and collecting the pods/seeds at three days interval from date of anthesis. Data were recorded on pod length and breadth, fresh and dry weight of pods and seeds, time required for onset of germinability and acquisition of desiccation tolerance and imposition of dormancy. Perusal of data reveals that maximum pod length (5.3 cm) and breadth (1.92 cm) was attained after 26 days of flower opening (DAFO) representing the phase of histo-differentiation. While maximum pod and seed fresh weight increased up to 34 DAFO representing the phase of reserve accumulation. Onset of germinability was observed after 20 DAF, while onset of desiccation tolerance reached after 34 days when imposition of physical dormancy was also initiated as seed moisture content fell below 18%. The seeds reached at physical maturity/agronomic maturity after 34 DAFO. The seed exhibit orthodox storage behaviour as recalcitrant seeds usually do not show this transition period between maturation and germination.

Economic analysis of production of major medicinal crops of

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Looking to the rapid increase in consumption of medicinal plant products, its commercial cultivation and export markets, the present investigation was undertaken with a view to examine the economic viability of the selected medicinal crops viz., isabgol, senna, coleus and ajowan grown in Saurashtra and Kutch regions of Gujarat state. In all, 200 farm households were selected randomly from 10 villages selected purposively from four talukas of Junagadh, Jamnagar and Kutch districts for the year 2006-07. The study revealed that the average total cost of cultivation of isabgol, senna, coleus and ajowan were Rs. 16469, Rs. 8224, Rs. 46205, and Rs. 15204 per hectare, respectively, while the net return realized per hectare was Rs. 11101, Rs. 4200, Rs. 112216 and Rs. 23704 in respective crops. The cost of production per quintal in case of isabgol, senna, coleus and ajowan was found about Rs. 1818, Rs. 701, Rs. 356 and Rs. 1696, respectively, while the average farm harvest prices obtained per quintal were Rs. 3043.05, Rs. 1058.26, Rs. 1221.66 and Rs. 4342.41 in respective crops. The input-output ratios over cost were 1.67 1.51, 3.43 and 2.56 in case of isabgol, senna, coleus and ajowan, respectively. The medicinal crops cultivation is economically viable and can generate handsome income to the farmers with less investment and efforts. Thus, cultivation of selected medicinal crops was found remunerative to the growers. In respect of constraints price fluctuations and high charges of transportation were major the issues faced by nearly two-thirds of medicinal crops growers. Lack of trading facilities of senna crop through regulated markets was the major bottleneck felt by all the farmers. More than 75% medicinal crops growers faced the problem of lack of storage facilities.