

Impact of vacuum packaging on various seed quality and biochemical parameters of different spice crops

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SUMMARY

The choice of a packaging material for any agricultural produce differs with the type of markets in which the products are distributed. In developing countries, this choice is largely determined by the cost and availability of packaging material. The situation, however, changes totally for spices that are marketed internationally where the main criterion is that the product has to be preserved and protected during handling and storage, and throughout extended transport and distribution networks. Dry spices though microbiologically safe when compared to the fresh produce, are not safe from oxidation of carotenoid pigments. Studies on vacuum packaging are, therefore, expected to address some of these problems and thus maintain quality for a relatively longer period. The main quality contributing factors of spices *viz.*, aroma, flavour and colour are sensitive to the vagaries of climate and are affected by factors like high temperature and humidity, moisture and oxygen, respiration and heating, insects, pests and microorganisms, which work together in causing deterioration. Traditionally, storage of spices in warehouse is done with a jute bag, Double gunny bags, multi wall paper sack or cotton bags are also being used for better protection. But these have the problem of moisture ingress, oxidation and subsequent quality loss. In case of dry whole chilies, due to low bulk density, volume poses a problem, which becomes a crucial factor in shipments and exports.

Key Words : Vacuum packaging, Dry spices, Flavour, Aroma, Colour, Shelf life, Quality deterioration, Traditional packaging

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Packaging is an important part of product processing and preservation and has direct influence on the system in respect to physical and chemical changes. Plastic materials are used very widely for food packaging application because of their obvious advantages of being light in weight, having good productivity, can be manufactured into a number of forms and shape and being recyclable (Narayanan and

Dordi, 1998). Though it is the last step in the post harvest operations, it is one of the most important contributors to the value of the produce. It plays an important role in the development of exports, because the foreign buyer expects the goods to be received in good condition. It also protects the contents from the environment and vice-versa, in order to ensure full retention of the utility value of the product and to prevent loss, damage and theft (Douglas *et al.*, 2005). The factors causing deterioration in foods are (i) inherent properties of the food which can not be prevented by packaging and (ii) properties which are dependent on environment and are possible to control by the type of packaging employed (Ranganna, 1986). One of the most important properties of flexible packaging materials is the degree to which they are able to resist the passage of gases and vapour. The mechanisms by which gases and vapour permeate through the packaging materials are: i) The presence of macroscopic pores and canals as in paper-based materials

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