

Economic Evaluation of Biodegradable Plastic Films and Paper Mulches Used in Open-Air Grown Pepper (*Capsicum annum* L.) Crop



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Abstract

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Black polyethylene (PE) is the most common mulching material used in horticultural crops in the world but its use represents a very serious environmental problem. Biodegradable films and paper mulches are available alternatives but farmers are reluctant to adopt them because of their high market prices. The aim of this paper is to evaluate the economic profitability of eight biodegradable mulching materials available for open-air pepper production. The economic evaluation is based on a four-year trial located in a semi-arid region of Spain. Three scenarios of PE waste management are examined: (i) absence of residues management, (ii) landfill accumulation, and (iii) total recycling. The inclusion of the costs of waste management and recycling under the current Spanish legislation only reduced the final net margin by 0.2%. The results show that an increase in subsidy rates of up to 50.1% on the market price would allow all biodegradable films to be economic alternatives to PE. The study supports the mandatory measures for the farmers to assume the costs of waste management and recycling. Despite savings in field conditioning costs, high market prices of biodegradable materials and papers are not compensated by the current level of subsidies, hampering their adoption in the fields.

Keywords:

waste management; economic evaluation; biodegradable mulch; polyethylene