

References

1. Siwek P. Warzywa pod folią i włókniną, Hortpress Sp. z o.o, Warszawa, Poland, 2010.
2. Siwek P, Libik A. Plastics covers in Polish horticulture. *Plasticulture* 2012; 9, 131: 65-73.
3. Siwek P, Domagała-Świątkiewicz I, Kalisz A. The influence of degradable polymer mulches on soil properties and cucumber yield. *Agrochimica* 2015; 59, 2: 108-123.
4. Martín-Closas L, Costa J., Pelacho AM. Agronomic effects of biodegradable films on crop and field environment. In: Soil degradable bioplastics for a sustainable modern agriculture. Malinconico M. (ed.), Springer-Verlag, GmbH, Germany, 2017: 67-104.
5. Kosterna E, Zaniewicz-Bajkowska A, Rosa R, Franczuk J, Borysiak-Marciniak I, Chromińska K. Effect of black synthetic mulches on the fruit quality and selected component of nutritive value of melon. *Acta Sci. Pol. Hortorum Cultus* 2010; 9, 3: 27-36.
6. Zawiska I, Siwek P. The effects of PLA biodegradable and polypropylene nonwoven crop mulches on selected components of tomato grown in the field. *Folia Hort.* 2014; 26, 2: 163-167.
7. Kołota E, Balbierz A. Yield potential and fruit quality of scallop squash (*Cucurbita pepo* L. var. *patissonina* Greb. f. *radiata* Nois.) cultivars grown for processing. *Acta Agrobot* 2015; 68, 3: 261-266.
8. Moreno MM, Moreno A. Effect of different biodegradable and polyethylene mulches on soil properties and production in a tomato crop. *Sci. Hortic.* 2008; 116: 256-263.
9. Haapala T, Palonen P, Tamminen A, Ahokas J. Effects of different paper mulches on soil temperature and yield of cucumber (*Cucumis sativus* L.) in the temperate regime. *Agr. Food Sci.* 2015; 24: 52-58.
10. López JC, Pérez Parra J, Morales MA. Plastics in agriculture, Almeria, Spain, 2009: 55-60.
11. Siwek P, Libik A, Twarowska-Schmidt K, Ciechańska D, Gryza I. Zastosowanie biopolimerów w rolnictwie. *Polimery* 2010; 55, 11-12: 10-15.
12. Penczek S, Pretula J, Lewiński P. Polimery z odnawialnych surowców, polimery biodegradowalne. *Polimery* 2013; 58, 11-12: 835-846.
13. Tan Z, Yi Y, Wang H, Zhou W, Yang Y, Wang C. Physical and degradable properties of mulching films prepared from natural fibers and biodegradable polymers. *Appl. Sci.* 2016; 6, 147.
14. Ammala A, Bateman S, Dean K, et al. An overview of degradable and biodegradable polyolefins. *Prog. Polym. Sci.* 2011; 36: 1015-1049.
15. Roy PK, Surekha P, Raman R, Rajagopal C. Investigating the role of metal oxidation state on the degradation behaviour of LDPE. *Polym. Degrad. Stabil.* 2009; 94: 1033-1039.
16. Pablos JL, Abrusci C, Marín I, et al. Photodegradation of polyethylenes: Comparative effect of Fe and Ca-stearates as pro-oxidant additives. *Polym. Degrad. Stabil.* 2010; 95: 2057-2064.

17. Gutiérrez-Villarreal MH, Zavala-Betancourt SA. A comparative study of the photodegradation of two series of cyclic olefin copolymers. *Int. J. Polym. Sci.* 2017.
18. Zenteno A, Lieberwirth I, Catalina F, et al. Study of the effect of the incorporation of TiO₂ nanotubes on the mechanical and photodegradation properties of polyethylenes. *Compos Part B* 2017; 112: 66-73.
19. García-Montelongo XL, Martínez-de la Cruz A, Vázquez-Rodríguez S, Torres-Martínez LM. Photo-oxidative degradation of TiO₂/polypropylene films. *Mater. Res. Bull.* 2014; 51: 56-62.
20. López-Tolentino G, Cárdenas-Flores A, Ibarra-Jiménez L, Guerrero-Santos R. Field performance of a foto-biodegradable film for soil mulching in zucchini crop. *R.I.I.T.* 2016; 3, 19: 11-19.
21. Waterer D. Evaluation of biodegradable mulches for production of warm-season vegetable crops. *Can. J. Plant Sci.* 2010; 90: 737-743.
22. Siwek P, Libik A, Kalisz A, Domagała-Świątkiewicz I. Zastosowanie prototypów wyrobów z PLA, PP z fotoaktywatorem i PBS w rolnictwie. W: Biodegradowalne wyroby włókniste. Krucińska I. (ed.), Wydawnictwo Politechniki Łódzkiej, Łódź, Polska, 2014: 392-416.
23. PN-R-04032. Soil and mineral materials. Sampling and determination of particle size distribution. 1998.
24. Yoder RE. A direct method of aggregate analysis of soils and a study of the physical nature of erosion losses. *J. Am. Soc. Agron.* 1936; 28: 337-351.
25. Domagała-Świątkiewicz I, Siwek P. The effect of direct covering with biodegradable nonwoven film on the physical and chemical properties of soil. *Pol. J. Environ. Stud.* 2013; 22, 3: 667-674.
26. Domagała-Świątkiewicz I, Siwek P. Effect of plastic mulches and high tunnel raspberry production systems on soil physicochemical quality indicators. *Int. Agrophys.* 2018; 32.
27. Siwek P. Modyfikacja warunków środowiska w uprawie ogórka i selera naciowego poprzez ściółkowanie gleby i bezpośrednie osłanianie roślin, Zesz. Nauk. AR w Krakowie, Ser. Rozprawy 2002; 279.
28. Kijchavengkul T, Auras R, Rubino M, Ngouajio M, Fernandez RT. Assessment of aliphatic-aromatic copolyester biodegradable mulch films. Part I: Field study, *Chemosphere* 2008; 71: 942-953.
29. Snyder K, Grant A, Murray C, Wolff B. The effects of plastic mulch systems on soil temperature and moisture in central Ontario. *Horttechnology* 2015; 25, 2: 162-170.
30. Dvořák P, Hamouz K, Kuchtová P, Tomásek J, Erhartová D. *Black polypropylene non-woven textile as mulch in organic agriculture*. Bořivoj Šarapatka (ed.) Bioacademy. Proc. Organic farming - a response to economic and environmental challenges, Olomouc, Czech Republic, 2009.
31. Kołota E, Adamczewska-Sowińska K. Application of synthetic mulches and flat covers with perforated foil and agrotexile in zucchini. *Acta Sci. Pol. Hortorum Cultus* 2011; 10, 4: 179-189.
32. Marcinčin A, Hricová M, Körmendyová E, Ujhelyiová A, Broda J, Janicki J. Polypropylene/(polyethylene terephthalate/polybutylene terephthalate) blend fibres:

phasestructure and mechanical properties. *FIBRES & TEXTILES in Eastern Europe* 2006; 14, 5(59): 92-97.

33. Rabiej M. Application of immune and genetic algorithms to the identification of a polymer based on its X-ray diffraction curve. *J. Appl. Cryst.* 2013; 46, 1136-1144.