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报告人简介:

中国农业科学院研究员，长期从事旱作农业、地膜覆盖与残留污染防控方面的研究工作；全国农业科研杰出人才。现任农业农村部农膜污染防控重点实验室主任；国际农膜协会（Comite International des Plastiques en Agriculture (CIPA)）主席；中国农业生态环境保护协会农用地膜污染防治专业委员会副理事长、兼秘书长。



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Profile of the Author:

Yan Changrong, professor in Chinese Academy of Agricultural Sciences, has long been engaged in the research of dry farming, film mulching and residual pollution prevention and control. He is the leading scientist of the national agricultural scientific research talents; director of the Key Laboratory of Agricultural Film Pollution Prevention and Control of MARA; chairman of the International Agricultural Film Association (Comite International des Plastiques en Agriculture (CIPA)); deputy director and Secretary General of the Association of agricultural film pollution prevention and Control, China Agricultural Ecological Environmental Protection Association (Specialized Committee).

中国地膜残留污染与生物降解地膜

地膜覆盖是我国应用面积最广的农艺技术之一，近年来，地膜年投入量保持在 150 万吨左右，覆膜面积近 3 亿亩，2018 年后由于地膜新国标的实施，地膜年投入量将超过 200 万吨。地膜覆盖技术广泛应用对保障我国农产品安全作出了巨大贡献。同时，地膜覆盖应用区域广、时间长、地膜厚度薄、强度低，回收技术和机具缺乏，回收意愿不高等原因导致地膜大量残留在农田中，农田地膜残留已经成为一种我国特有的污染问题。尤其是在西北和华北北部地区，长期覆膜农

田的地膜残留污染已经十分严重,造成土壤结构破坏、影响农事操作和作物生长、导致视觉污染,增加劳动力投入、影响农产品质量等一系列问题。

生物降解地膜替代 PE 地膜是解决农田地膜残留污染的重要手段之一,随着合成技术、工艺和设备的改进与突破,生物降解地膜配方和工艺的改进和完善,生物降解地膜替代部分 PE 地膜已经成为可能。2015 年以来,连续 4 年在全国 30 多个试验点,7 种农作物的试验结果显示,生物降解地膜的操作性、功能性、可控性、经济性是其能否大面积应用的关键;生物降解地膜在烟草、花生、加工西红柿、马铃薯、蔬菜等作物具有较好适宜性;区域上,华北和西北灌溉区、西南地区的生物降解地膜适宜性较高,而在干旱和半干旱地区的旱作农业区,生物降解地膜的应用应该慎重。

Plastic Mulch Film Residual Pollution and Bio-film in China

Film mulching is one of the most widely agronomic techniques applied in China. In recent years, it is about 1.5 million tons mulching film used per year, and covering area nearly 300 million Chinese mu. Because of implementation of a new national standard of mulching film in 2018, the annual consumption of mulching film will exceed 2 million tons soon. The wide usage of plastic film mulching technology has made great contributions to ensure the safety of agricultural products in China. However, the mulch films were super thin in thickness and low in tensile strength, would break down to small pieces at the end of the season, which meant the films were difficult to be collected by hands and there was no technology or machinery in place for collection. Over the years, the mulch film residuals were left in the land and became a special soil pollution problem in China, especially in northwest and northern part of North China. The level of mulch film residue was as high as 200kg/mu, which induced a number of side effects, such as soil structure destruction, agricultural operation blocked, crop growth hindered, the visual pollution, labor input more, and quality of agricultural products declined.

The replacement of PE film by bio-film is one of the important solution to solve plastic residual pollution. With the improvement and breakthrough of synthetic

technology and processing of bio-material, and the control of biodegradability of film, bio films are now available in the market to replace part of the PE film for certain crops in special regions. Since 2015, the trial results, of 7 kinds of crops cross over 30 trial sites for a period of 4 years in China, have shown that the operability, function, controllability and economy of bio-film are key points to large area application, and the bio-film is better suitable for tobacco, peanut, tomato for industry, potato, vegetable and so on. The suitability of bio-film is good in the irrigated areas of north and northwest region, southwestern region, and the application of bio-film should be prudent in rainfed area of semiarid and arid region.