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➤ 前沿资讯

1．Soil-biodegradable plastic increases tomato yield（土壤可生物降解塑料可以增加番茄产量）

简介：地膜用土壤可生物降解塑料可以使番茄产量增加50%。巴斯夫提供了一种经认证的土壤可生物降解塑料ecovio M 2351，可用于番茄种植的覆膜。自2012年推向市场以来，农民已经使用这些经过认证的ecovio土壤可生物降解地膜超过6年。由ecovio M 2351制成的地膜可以在机械收割后犁入土壤，因为土壤中自然存在的微生物将膜的结构识别为它们可以代谢的食物。

增加番茄产量

巴斯夫说："此外，与裸土种植相比，由ecovio制成的覆膜可以使番茄产量从15%增加到50%，减少用水量，使用更少的除草剂以更好地控制杂草。"

对真菌疾病的抵抗力更高

据该公司称，农民们还发现，番茄对真菌病的抗性更高，收获时间更早，品质更好、更均匀，Brix指数（即番茄中的糖水比）也更高。

塑料薄膜可作为食物

据巴斯夫报道，瑞士苏黎世联邦理工学院的一项研究表明，土壤中的细菌和真菌等微生物可以利用塑料PBAT制成的薄膜作为食物。微生物从聚合物中吸收碳以产生能量并形成生物质。生物降解后的最终产物为二氧化碳、水和生物质。"这意味着PBAT会在土壤中进行生物降解，并不会像PE那样留在土壤中。因此，土壤可生物降解地膜有助于更好的植物根系发育，更好的植物生长和改善土壤质量，"巴斯夫说。

来源：Future Farming

发布日期：2019-08-27

全文链接：

http://agri.ckcest.cn/file1/M00/0E/80/Csgk0F1oieGACPncAAU45vX2Apg542.pdf

2．Future Farming 3: How to benefit from precision tech（未来农业3：如何从精准技术中获益）

简介：The August edition of Future Farming (issue 3) can now be read in the digital magazine section.

Precision technology can help farmers and contractors a great deal in achieving what they aim for: good and healthy yields with respect for the environment. But first and foremost, it should help them save and earn money.

Freeing ag machinery data

Something that Australian farmer Andrew Slade has doubts about, after travelling the world. We have 3 farmers sharing their reasons and ideas about 'freeing ag machinery data' by mapping tractor data like fuel consumption in order to save money on soil scans.

Top 10 most innovative farmers

And then there's the Dutch nominee for our 10 most innovative farmers, Jacob van den Borne, who has always had an eye for the best precision technology available. But now he is at the verge of resisting the urge to always operate with and own the latest and newest technology.

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He is already using a small autonomous tractor, and that's the future, according to Marien van Breugel from Precision Makers, now part of the Alamo Group.

Field robots

As far as field robots are concerned, we share different views on why the market for these lacks direction and collaboration. And AgroIntelli CEO Ole Green explains why he feels that the single furrow horse plough is still one of the greatest agricultural machines ever invented.

British and Canadian service providers are explaining how drones can help find more useful and accurate agronomic insights, and how to increase Brazilian yields by up to 50%.

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> ## 学术文献

1．Electrochemical Methodologies for the Detection of Pathogens（检测病原体的电化学方法）

简介：Bacterial infections remain one of the principal causes of morbidity and mortality worldwide. The number of deaths due to infections is declining every year by only 1% with a forecast of 13 million deaths in 2050. Among the 1400 recognized human pathogens, the majority of infectious diseases is caused by just a few, about 20 pathogens only. While the development of vaccinations and novel antibacterial drugs and treatments are at the forefront of research, and strongly financially supported by policy makers, another manner to limit and control infectious outbreaks is targeting the development and implementation of early warning systems, which indicate qualitatively and quantitatively the presence of a pathogen. As toxin contaminated food and drink are a potential threat to human health and consequently have a significant socioeconomic impact worldwide, the detection of pathogenic bacteria remains not only a big scientific challenge but also a practical problem of enormous significance. Numerous analytical methods, including conventional culturing and staining techniques as well as molecular methods based on polymerase chain reaction amplification and immunological assays, have emerged over the years and are used to identify and quantify pathogenic agents. While being highly sensitive in most cases, these approaches are highly time, labor, and cost consuming, requiring trained personnel to perform the frequently complex assays. A great challenge in this field is therefore to develop rapid, sensitive, specific, and if possible miniaturized devices to validate the presence of pathogens in cost and time efficient manners. Electrochemical sensors are well accepted powerful tools for the detection of disease-related biomarkers and environmental and organic hazards. They have also found widespread interest in the last years for the detection of waterborne and foodborne pathogens due to their label free character and high sensitivity. This Review is focused on the current electrochemical-based microorganism recognition approaches and putting them into context of other sensing devices for pathogens such as culturing the microorganism on agar

plates and the polymer chain reaction (PCR) method, able to identify the DNA of the microorganism. Recent breakthroughs will be highlighted, including the utilization of microfluidic devices and immunomagnetic separation for multiple pathogen analysis in a single device. We will conclude with some perspectives and outlooks to better understand shortcomings. Indeed, there is currently no adequate solution that allows the selective and sensitive binding to a specific microorganism, that is fast in detection and screening, cheap to implement, and able to be conceptualized for a wide range of biologically relevant targets.

来源：ACS SENSORS

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http://agri.ckcest.cn/file1/M00/0E/80/Csgk0F1oiJ2ALC_aAJviCqAg5Ec547.pdf

2. Microfluidic devices for sample preparation and rapid detection of foodborne pathogens（用于制备样品和快速检测食源性病原体的微流体装置）

简介：Rapid detection of foodborne pathogens at an early stage is imperative for preventing the outbreak of foodbome diseases, known as serious threats to human health. Conventional bacterial culturing methods for foodborne pathogen detection are time consuming, laborious, and with poor pathogen diagnosis competences. This has prompted researchers to call the current status of detection approaches into question and leverage new technologies for superior pathogen sensing outcomes. Novel strategies mainly rely on incorporating all the steps from sample preparation to detection in miniaturized devices for online monitoring of pathogens with high accuracy and sensitivity in a time-saving and cost effective manner. Lab on chip is a blooming area in diagnosis, which exploits different mechanical and biological techniques to detect very low concentrations of pathogens in food samples. This is achieved through streamlining the sample handling and concentrating procedures, which will subsequently reduce human errors and enhance the accuracy of the sensing methods. Integration of sample preparation techniques into these devices can effectively minimize the impact of complex food matrix on pathogen diagnosis and improve the limit of detections. Integration of pathogen capturing bio-receptors on microfluidic devices is a crucial step, which can facilitate recognition abilities in harsh chemical and physical conditions, offering a great commercial benefit to the food-manufacturing sector. This article reviews recent advances in current state-of-the-art of sample preparation and concentration from food matrices with focus on bacterial capturing methods and sensing technologies, along with their advantages and limitations when integrated into microfluidic devices for online rapid detection of pathogens in foods and food production line.

来源：BIOTECHNOLOGY ADVANCES

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http://agri.ckcest.cn/file1/M00/0E/80/Csgk0F1oh7eAI219ACNBUga1JQQ997.pdf

3．Detection of Pathogenic Microorganisms by Microfluidics Based Analytical Methods（微流控分析法检测病原微生物）

简介：Microfluidics based biochemical analysis shows distinctive advantages for fast detection of pathogenic microorganisms. This Feature summarizes the progress in the past decade on microfluidic methods for purification and detection of pathogenic bacteria and viruses as well as their applications in food safety control, environmental monitoring, and clinical diagnosis.

来源：ANALYTICAL CHEMISTRY

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➤ 相关专利

1．DEVICE FOR NUCLEIC ACID EXTRACTION USING MAGNETIC BEAD METHOD（一种磁珠法核酸提取装置）

简介：The present invention provides a device for nucleic acid extraction using a magnetic bead method. The device includes a disc turntable in an inverted disc shape, an arc arch bridge base disposed right below the disc turntable, a supporting column connecting the disc turntable and the arc arch bridge base and disposed in the center of a disc along a vertical direction, and a magnet structural unit and a sample reaction unit which are arranged on the disc turntable. The disc turntable includes a top plate, and the top plate is sequentially provided with guide rod insertion holes and sample reaction unit insertion holes from the circumference to the circle center of the top plate; the arc arch bridge base includes a bottom plate arranged at the lowermost portion and an arc supporting plate arranged on the bottom plate, and the arc supporting plate corresponds to the guide rod insertion holes in position in a radial direction of the disc, and the arc supporting plate includes raised regions used for jacking up a guide rod and a magnet and groove regions used for allowing the guide rod and the magnet to fall. The device provided by the present invention can realize the automatic nucleic acid extraction in a stream-lining manner.

来源：欧洲专利局

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