

CONTROLLED RELEASE OF PESTICIDES FROM PLASTIC MULCHES – AN ALTERNATIVE TO SOIL FUMIGANTS?

Dr. Ralf Dujardin, Imaflex Inc.

Pre-Plant soil fumigation is indispensable in high-productive mulched fruit and vegetable production nowadays. Soil fumigants are volatile, broad-spectrum pesticides with the unique ability to move quickly through the soil, achieving and maintaining a uniform, toxic concentration in the topsoil over a limited period of time. This will give new crops a pest free (or low pest) zone to start off. Applying non-volatile pesticides uniformly and efficiently as fumigants in topsoil is a challenging constraint of current spray and chemigation technologies.

Controlled release of non-volatile pesticides from plastic mulches can overcome those constraints and also the risks associated with fumigants, e.g. volatility, toxicity and/or odor, for operators, bystanders and the environment. Approaches in the past failed because of the inability of the controlled release mulches developed to complete the pesticide release effectual before harvest in compliance with label requirements – the pre-harvest interval of the selected pesticides - for safe to eat crops.

ADVASEAL® HSM is a plastic mulch film that releases a selective herbicide to control certain broadleaf weeds and nutsedge. The herbicide, Halosulfuron-Methyl* (HSM), is continuously and completely delivered over three to four days leading to better efficacy, higher crop yields and lower application costs. ADVASEAL® HSM is the first controlled release plastic mulch that ever has received a pesticide registration worldwide. US-EPA registered it as new herbicide formulation for approved crop uses on asparagus, cucumbers, cantaloupes, melons, pumpkins, squash and tomatoes. ADVASEAL® HSM is currently already commercial available in the Southeast of the US, where most states have completed registration.

ADVASEAL® HSM delivers a combination of efficacy, simplicity, and safety for the control of noxious weeds and in addition controls emission of fumigants (required for a transition period for soil borne pathogen control). Data are reviewed across trials for efficacy, crop safety, fumigant containment, and agronomic suitability of ADVASEAL® HSM for selected crop production systems.

These characteristics of ADVASEAL® HSM are discussed in light of its suitability to release in addition selective nematicides and fungicides to provide in combination with herbicides a sufficient broad band activity to replace soil fumigants in pre-plant soil sanitation.