VIF:- A SUPPLIER'S VIEW

Riccardo Rimini and Simon Wigley*, Bruno Rimini Corp

This information is based on our experience with Bromostop VIF manufactured by IPM (Industria Plastica Monregalese) of Italy.

What is a Virtually Impermeable film?

In appearance a VIF is indistinguishable from an ordinary LDPE film which is commonly used in agriculture. But there is a fundamental difference in structure. LDPE is commonly extruded as a single layer of a single polymer of ethylene. VIF consists of multiple layers of different polymers. One or more of these layers have the characteristic of being much less permeable to gases than LDPE. Typically the difference can be in the ratio of at least 300:1.

History of VIF

VIF is not a new product. It was first invented about 30 years ago for use in packaging. A typical pack of meat on a supermarket shelf is covered with transparent VIF to keep out Oxygen and increase the shelf life. Typically this film would be made in rolls a few inches wide.

Broadcast Fumigation

About seven years ago researchers involved in the reduction of Methyl Bromide emissions approached plastics manufacturers to find out if they could supply VIF for use in agriculture. In the first instance interest was for use in broadcast fumigation. There were a number of challenges:

1. To be able to make film up to 13 feet wide instead of a few inches wide.

2. To provide the strength and elasticity needed in the field.

   These problems were soon resolved, and broadcast VIF has been used commercially in Europe for about 5 years. The consumption of fumigant in these circumstances has been reduced by up to 50%.

3. A third problem connected with broadcast fumigation using VIF derives from the fact that each sheet of film as it is laid in the field has to be glued to the preceding sheet. The solvent applied to the first sheet needs to evaporate and pass through the new sheet, and, as this is impermeable, evaporation is delayed so delaying the time to achieve full tack. A number of ways have been found to alleviate this problem in practice, and recently a new glue has been developed by the plastics manufacturer which achieves the fast tack needed. This appears to be the definitive solution to the problem. This glue is starting to be used commercially in Europe.

Bed fumigation with VIF mulch

We were first asked for VIF mulch 6 years ago, and the requirements for this product are much more demanding than for broadcast VIF for the following reasons.

1. The stresses to which it is subjected in the field are much greater as it has to fit tightly over the profile of the bed and then be buried along the edge.

2. The life required is far longer. Typically about 1 year, though in England a life of 3 years is demanded.

3. The film often has to be coloured (Black, White, Green, etc), and the addition of pigment to the film affects its other characteristics.

It took about two years to overcome these problems, and VIF mulch has been sold commercially in England and France for three years.

In Florida several laying trials were carried out at the University and the USDA in April 2003, and these were very successful with laying speeds achieved of up to 6mph. Some of the film was left on the ground for 10 months and was still in good condition in February 2004, having survived throughout the Spring and Summer.

Although Bromostop VIF does not have the same elasticity as polyethylene due to the nature of the raw material, it has proven to be strong and flexible enough to meet the demanding requirements of growers in a wide range of situations providing that appropriate adjustments are made.

Costs

After laying, the next major concern is the cost.

VIF mulch is at present more expensive than LDPE though, depending on circumstances the difference can be offset by saving in fumigant. With increased use of VIF major savings are available for the following reasons:

1. Reduction in cost of specialised raw materials.
2. Improvement in production by installation of dedicated machinery.

Accordingly once VIF starts to be used on a substantial scale its price can come down a good deal. Once the price has come down an overall saving can be expected by the farmer because of the reduction in use of fumigant.