PLASTIC FANTASTIC FOR THE 21ST CENTURY

How Green is polythene ?


PLASTIKA KRITIS S.A.

Down Gauging

Current price €.965 per Kg
200 mu = 187 grams per sq. metre = €0.182
180 mu = 168 grams per sq. metre = €0.162
150 mu = 141 grams per sq. metre = €0.136

Films will get thinner 2010

Strength

Films getting stronger
MLLDPE

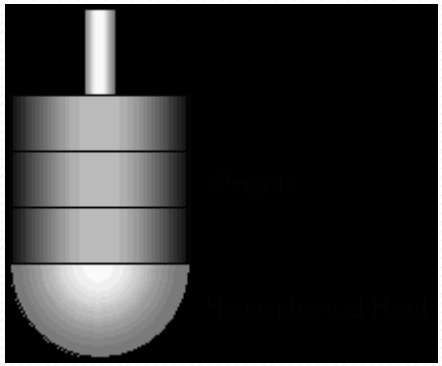
That's how films have got thinner – and stronger

I Mega Pascal = 145 PSI

Comparison	Thickness	light transmission	UV status	Diffusion	Thermicity	Strength	Impact
SunMaster SuperThermic	150 mu	~88%	open	60%	>90%	25 Mpa	>1000g
BPI Polytherm *	180 mu	90 %	normal	22%	82%	7.5 Mpa	>550g

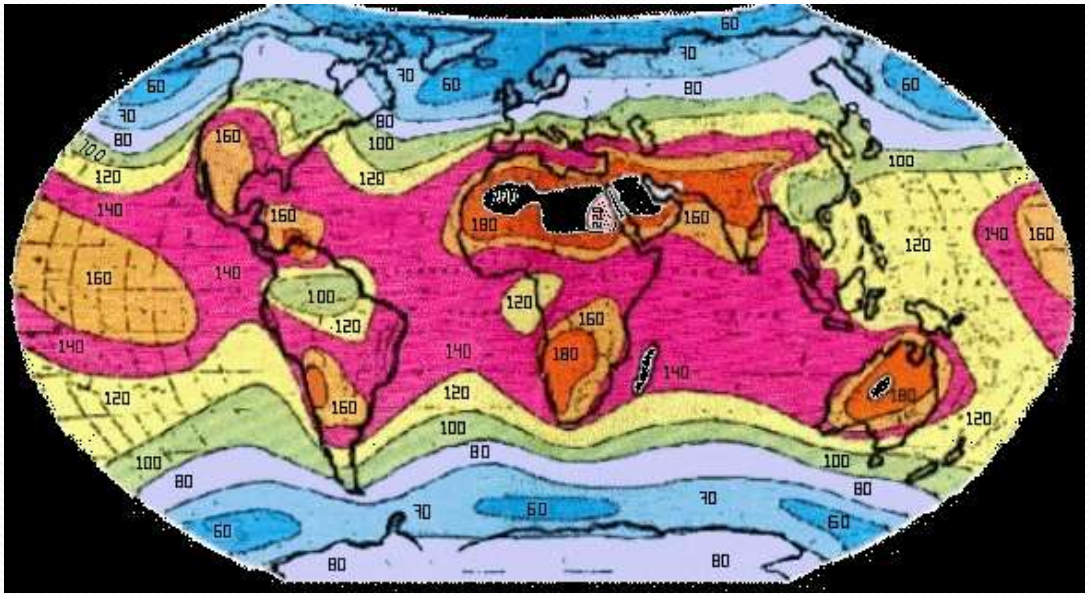
*Source BPI Polythene facts

The weight required to cause 50% of tested films to failure by impact from a falling dart under specified test conditions. Impact resistance is only partially thickness dependant, as a result impact values cannot be normalized by thickness without producing misleading data.



Method	Dart Head Diameter	Drop Height
A	38 mm	0.66 m
B	50 mm	1.50 m

GENERALIZED ISOLINES OF GLOBAL RADIATION
(Kcal./cm^3/yr) expressed in Kilo-Langley per year.



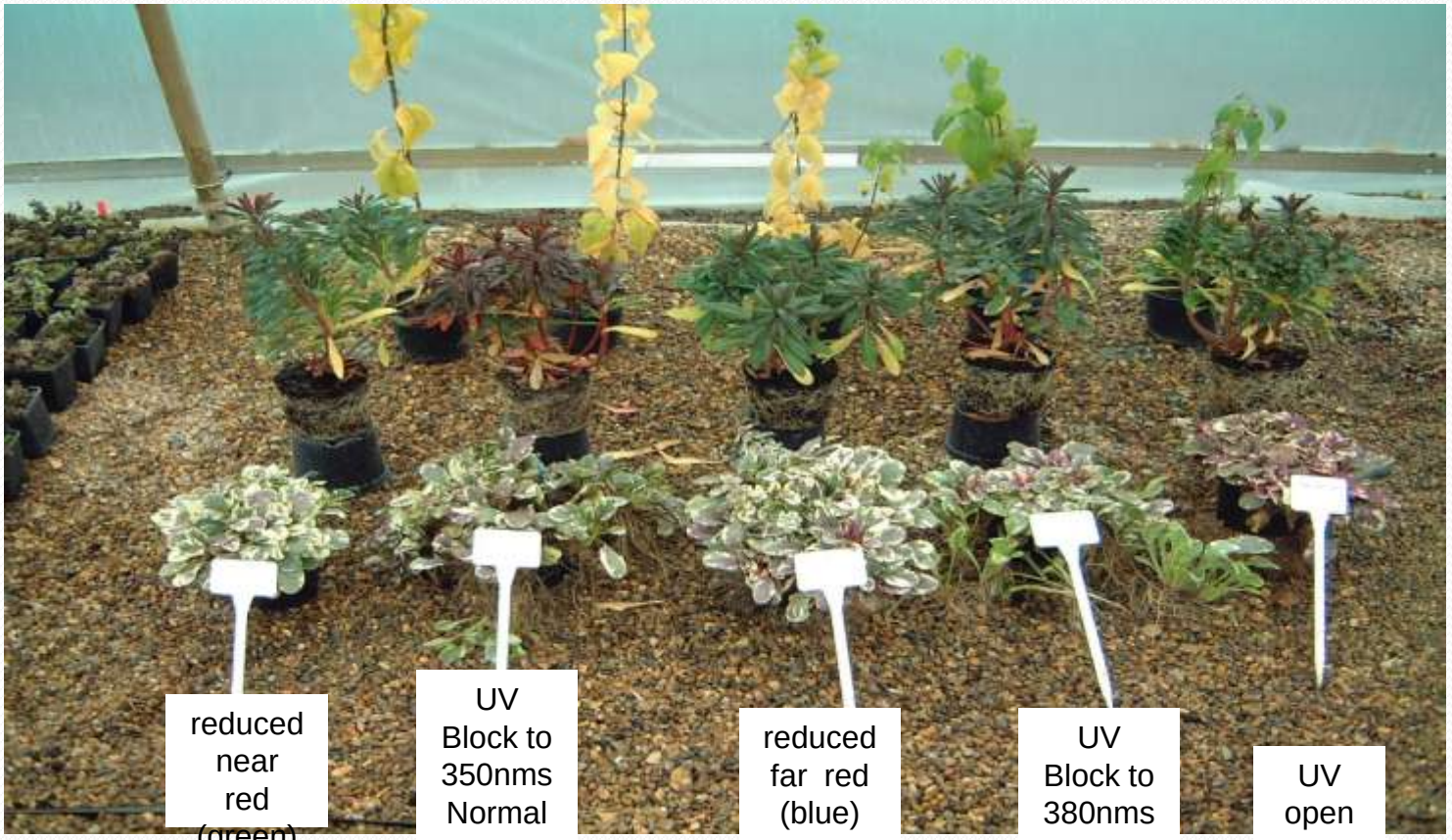
Cover life has less to do with thickness than it is to do with the amount of UV stabilisers.

UV levels worldwide
73 Kilo Langleys
UV will consume a set amount of Stabiliser per year.
So to make it last 7 years we include the amount of stabiliser to last for 7 years

How can polythene help you grow better plants ?

Spectral Filters

See how different spectral transmissions affect the same variety of plant

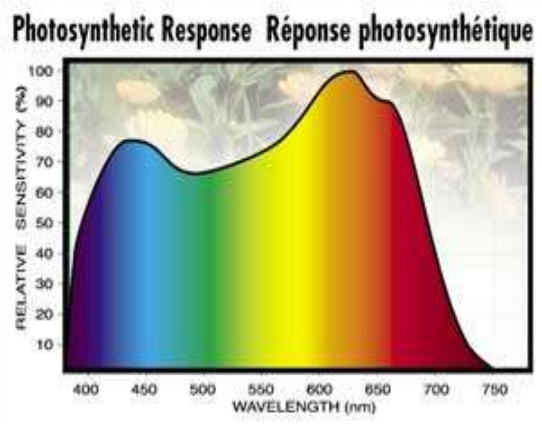


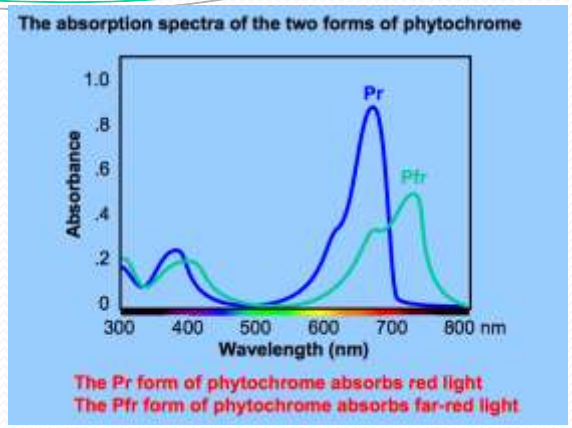
New technology - This will be big in the 21st century – Not enough information at present

UVC	200-280 nm	Totally absorbed by the atmosphere
UVB	280-320 nm	Influencing coloration & plant height Causes degradation of plastic films
UVA	320-400 nm	Sporulation of fungi, insect behaviour, film degradation

VIOLET	400-430 nm	Influence on photosynthesis
INDIGO	430- 450 nm	Influence on photosynthesis
BLUE	450-520 nm	Strong influence on photosynthesis (phototropic curvature in shoots, non etiolated growth of seedlings, stomata opening
GREEN	520- 565 nm	Very small influence on plants
YELLOW	565-590 nm	Practically no influence on plants
ORANGE	590-625 nm	Small influence on photosynthesis and photoperiodism
RED	625-700 nm	Strong influence on photosynthesis & photo-morphogenesis (seed germination, flowering, dormancy, abscission)

FAR RED	700-800 nm	Influences photomorphogenesis, hence affecting the growth process
NEAR INFRA- RED	800-1300 nm	Useless for plants - transfers heat inside the greenhouse during daytime
FAR INFRA- RED	> 1300 nm	Transfers heat. Radiation from 7 to 14 mic. and above is responsible for heat losses from a greenhouse during night





The Pfr light allows plants to detect when they are shaded.

Pr peak absorption at 660nms Pfr peak absorption at 730 nms.

Plants adapted for growth in full sun will display greater stem elongation when they are transferred to shade.

They also develop smaller leaves and less branching. This change is due to greater proportion of Pr to Pfr.

Sunlight has a R:FR ratio of 1- 2

Light under a canopy of leaves can have a R:FR ratio of 0-13

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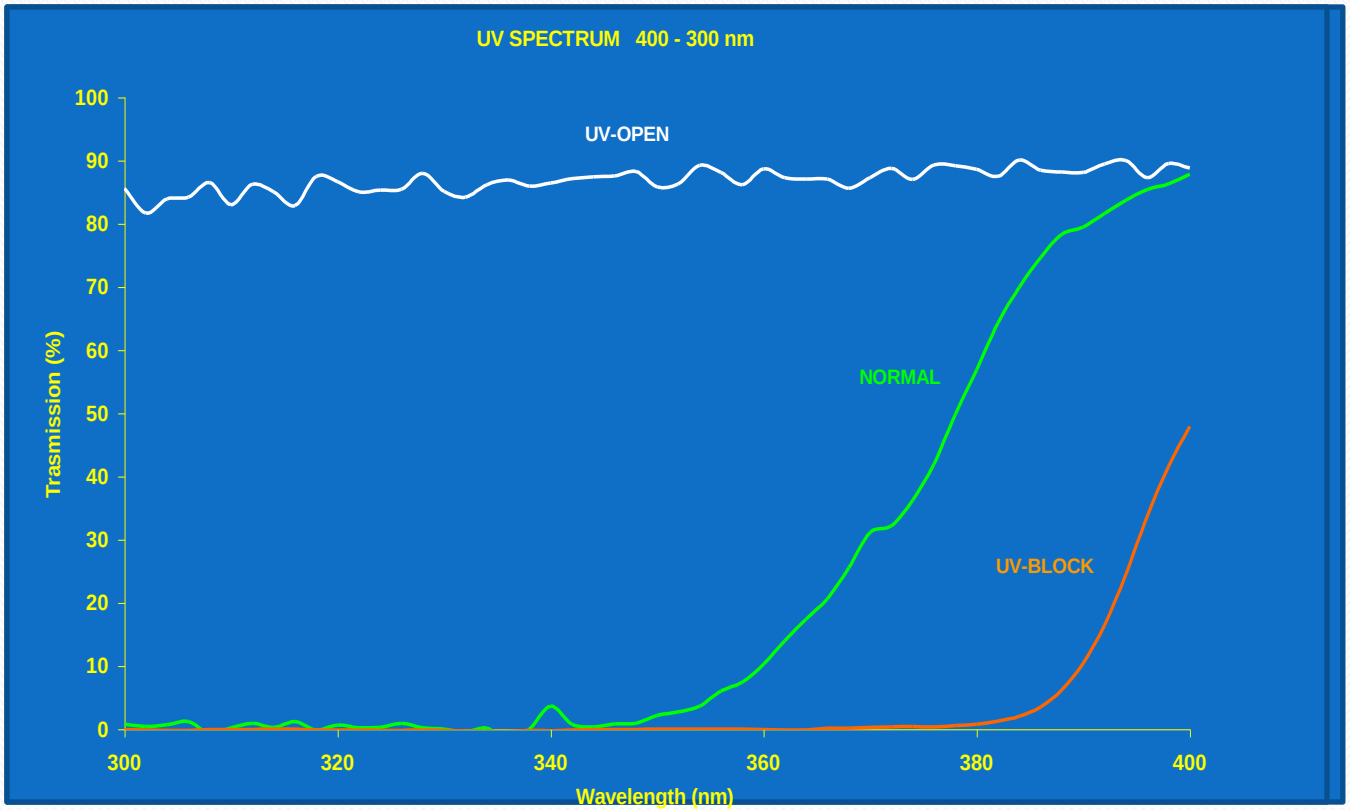


UV blocking films

Ultraviolet Blocking Greenhouse Polythene Covers for Insect Pest Control on Organic Crops:
May 2003 – September 2004
Leigh Morris, Welsh College of Horticulture

October 2004

UV blocking increases foliage area

This report is also available at
http://www.organic.aber.ac.uk/library/UVBlockingpolytunnels.pdf

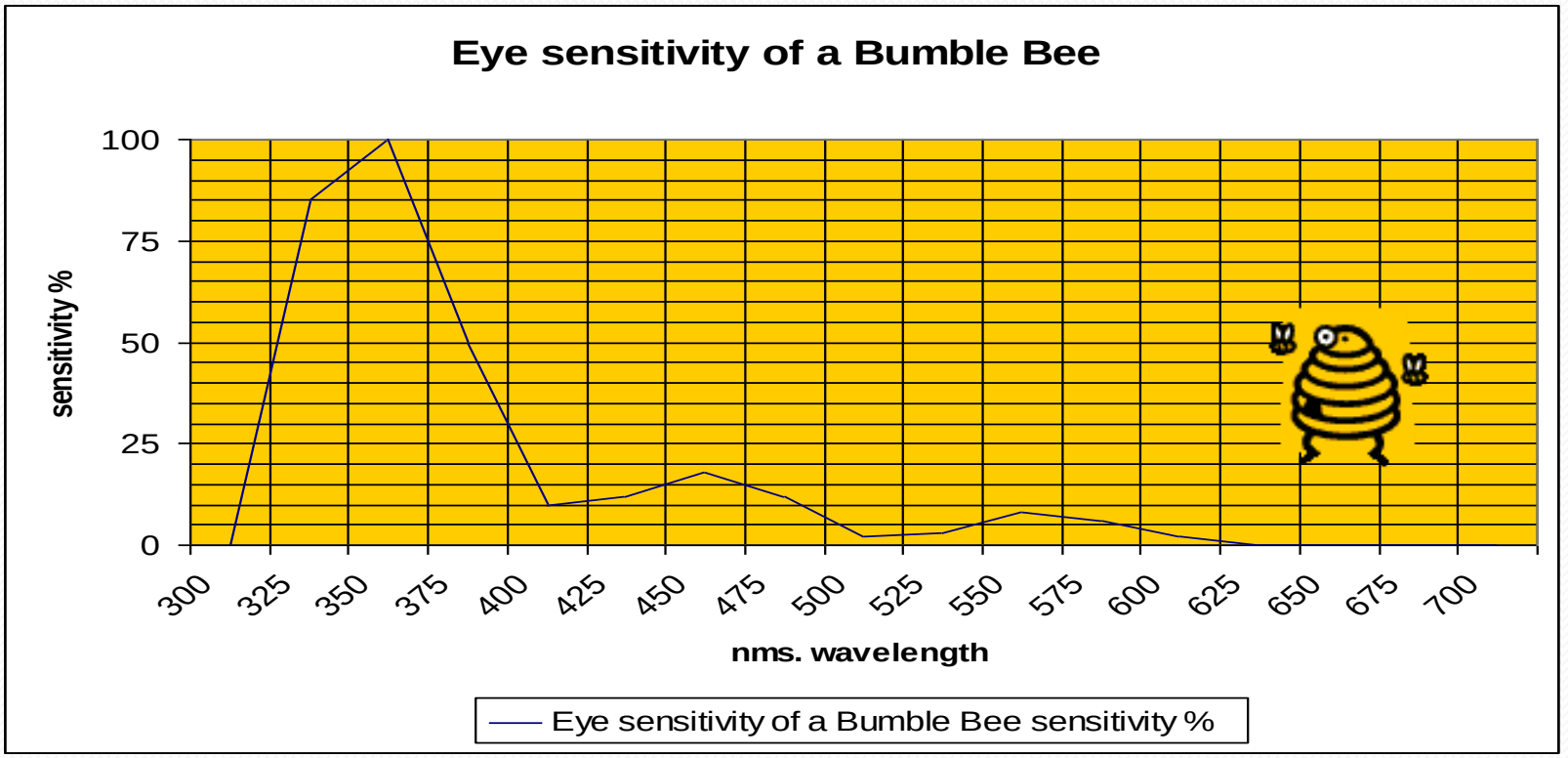
(left – Tunnel 1: UV-blocking film) and (right – Tunnel 2 non UV-blocking film) showing the increased crop size of the plants grown in the UV-blocking tunnel. This was representative of all crops within the two tunnels, (which were all planted at exactly the same spacing) but was most significant with the lettuces.
NB: compare the soil area visible in the two photographs

Organically grown

Conventionally grown

(Tunnel 1: UV-blocking film) and (Tunnel 2: non UV-blocking film), representative photographs showing the significantly higher level of eating damage to

eaves on the crops grown under the non UV-blocking film (Photos taken .2/03).


Eye sensitivity of a Bumble Bee
100
75
50
25
0
sensitivity %
300
325
350
375
400
425
450
475
500
525
550
575
600
625
650
675
700
nms. wavelength
Eye sensitivity of a Bumble Bee sensitivity %

Conclusions of the trial

Conclusions:

The level of pests, both flying and non-flying, was noticeably less within the tunnels covered in the UV blocking film.

The flight behaviour of insects was less under the UV blocking film.

The speed of growth and eventual final size of the crops appeared to be greater within the tunnels covered in the UV blocking film.

Energy efficiency of cladding materials

1. Glass, single layer	~1.13
2.Glass, double layer,1/4" gap	~0.65
3. Thermic PE film, single layer	~1.15
4. PE film, double layer, seperated	~0.70
5. New SuperThermic Film	~0.85

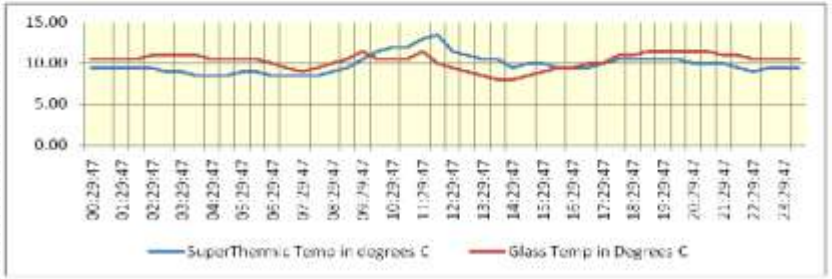
Grower Experience Report. No 1

Product.	SunMaster SuperThermic	Trial Date	Dec 09 - ongoing

Trials of the new SunMaster SuperThermic tunnel covers were conducted at IPPS President Mike Norris's New Place Nursery at Pulborough in West Sussex by freelance consultant David Hutchinson. (DHS - Horticulture & Ornamental Crops Consultant)

They were undertaken over a very cold part of the winter using a glasshouse with a thermal screen and a single span polytunnel covered by SunMaster SuperThermic polythene, and no thermal screen. Both had under floor hot water heating because they are both used for propagation.

A graph snap shot of the results shows the data from the 3rd of February 2010. Although only showing one twenty four hour period they are very indicative of the results taken over the entire period of the trial reports David Hutchinson. The results were taken by Easylog data loggers which take temperature, humidity and dew point readings every 30



minutes and are supplied by Dove Associates. For this trial we are only using the temperature records.

The data loggers in both houses are placed in the air approximately 2m above floor level, and below the thermal screen in the glasshouse. Further data shows the temperature at crop level to be consistently ½ a degree C. warmer than the temperature at 2m above the crop, both under the SuperThermic and the Glass with Thermal Screens.

SunMaster SuperThermic is manufactured by Plastika Kritis using a new technology developed by their own master batch company and is not available for general sale to other polythene manufacturers.

XL Horticulture comments that for growers without expensive glasshouses and thermal screens SunMaster SuperThermic has the potential to reduce their carbon footprint and save vast amounts on their heating bills.

SunMaster SuperThermic is diffused and temperature reducing in summer. This will make it typically 10% cooler on a hot summers day than a clear film.

SunMaster SuperThermic not only has anti drip additive (called by others AF) but also a true anti fog additive to reduce the number of days that you get a fog in the tunnel. This is also another additive exclusive to XL Horticulture and Plastica Kritis.

SunMaster SuperThermic contains an advanced co polymer additive which allows it to be made thinner than other films (600 gauge or 150 mu) and gives it a higher tear strength than other films, even though they may be thicker.

For further details about this and other XL Horticulture products visit www.xlhorticulture.co.uk or telephone on 01404 823044
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