

# AGROTOP

## Light Controlled House



*Published by AGROTOP Marketing Department*

# Company Profile

- Specializing in agriculture turnkey projects, for poultry and livestock market, since 1989
- Extensive experience with international poultry and livestock sector
- Erecting thousands of square meters of houses each year
- Cooperate with world's leading poultry and livestock equipment suppliers



# Lighting Control

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To receive optimal results in pullet / breeder houses, the lighting hours and intensity must be precisely controlled.

In order to ventilate the house needed an air exchange system that will bring fresh air into the house while blocking completely the light from entering, light traps is the answer

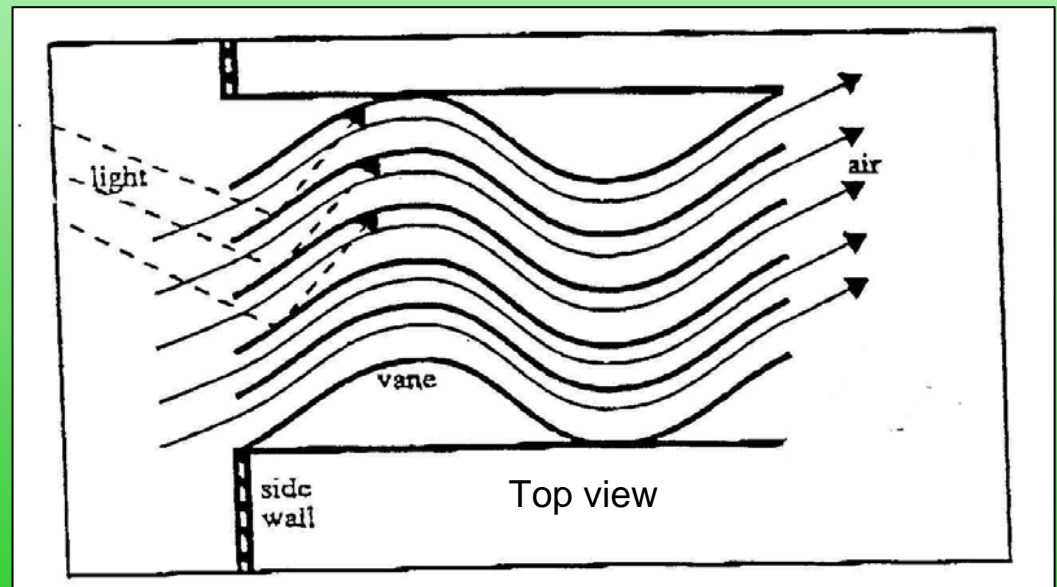
# Lighting Control

- The house must be totally sealed for external light during highest intensity day light.  
The recommended light intensity at any point should not exceed 0.005 foot/candle (0.00042 lux)
- The house must be mechanically ventilated at all time when light control is applied



# Light Traps Principle

The principle of light traps is based on the optical principle:  
The air can travel through curves while the light must travel through straight lines



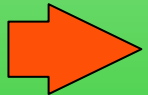
# Light Traps Shape

The light traps efficiency to light blocking with minimum air flow resistance is depending on:

- leafs density
- leafs surface area and material type
- Light traps thickness
- Sharpness and Number of curve that the air need to go through

# Light Traps Level

$$\frac{\text{Max daylight intensity} \\ (10,000 \text{ F/Can})}{\text{House required intensity} \\ (0.005 \text{ F/Can})} = \text{Light Traps reduction Level} \\ (2,000,000)$$



Light trap must have a minimum light reduction of 2,000,000

# Air Flow Resistance Level Of Light Traps

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- Changing of negative pressure in the poultry house indicate the resistance of the light trap to air flow.
- As much as light trap allows free air flow the efficiency of the fans is better
- Poor light traps can reduce the fans efficiency in more then 50%

# Design

There is few design stages for fans system in light controlled house to be considered:

1. Deciding upon the no. of fans in order to create ventilation under negative pressure of 0.15"-38 pa
2. Establishing the surface of light trap needed according to type, data of light trap and the capacity of fan

# Light Controlled Systems

The light controlled comprise the following systems:

- House side wall
- Ventilation systems
- Air inlets systems
- Cooling systems
- Light control systems

# House side wall



Panel



curtain

# Advantage For Wall Types

Description	Panel	½ Panel / Curtain	Curtain
Thermal Insulation	Very High	High	Low
Sealing	Very High	Very High	High
Maintenance	Very Low	Low	Very High
Purchasing Cost	High	Very High	Low
Insurance Cost	High	Low	Low
Operation Cost	Very Low	Low	Very High
Natural Ventilation	Impossible	Possible	Possible
Emergency Opening	Impossible	High	Very High

# Natural Ventilation and Emergency

Natural ventilation is possible in curtain houses only,  
It's important to have high quality curtains with long life tear resistance,  
not allowing small holes to penetrate light into the house

Curtain rolling with tubes instead of cables are reliable and accurate.  
It's advisable to add active curtain drop that will open the curtain in  
case of power failure, will reduce insurance cost and will  
give grower "peace of mind"

# Active Drop Curtain

Active drop curtain comprise:

- Control panel
- Dry battery (no maintenance)
- Battery charger
- Smart electronic card



# Active Drop Curtain

## System working method

- In case of power break for more than adjusted time (3 min) the system will force the curtain to open to max position and will activate alarm system
- The system have a self checking mode that is checking the position of curtain and alert if the curtain is not open sufficiently. The system check the battery condition that is being checked every 12 hours under full capacity and will give alert if battery is starting to drain

# Tunnel Ventilation Inlet

Seal Type	Characteristics
<b>Top Seal</b>	<ul style="list-style-type: none"><li>• Precise and automatic rolling system</li><li>• Top to bottom opening</li><li>• Thermal insulated system</li><li>• Long life span</li></ul>
<b>Roll Seal</b>	<ul style="list-style-type: none"><li>• Precise and automatic rolling system</li><li>• Bottom to top opening</li><li>• Superior Thermal insulated system</li><li>• Long life span</li></ul>
<b>Drop Seal</b>	<ul style="list-style-type: none"><li>• Top to bottom opening</li><li>• Thermal insulated system</li><li>• Short life span</li></ul>



Top Seal

# Tunnel Ventilation Inlet

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Roll Seal

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Drop Seal

# Cooling System (Cooling pads)

## Cooling Pads Types

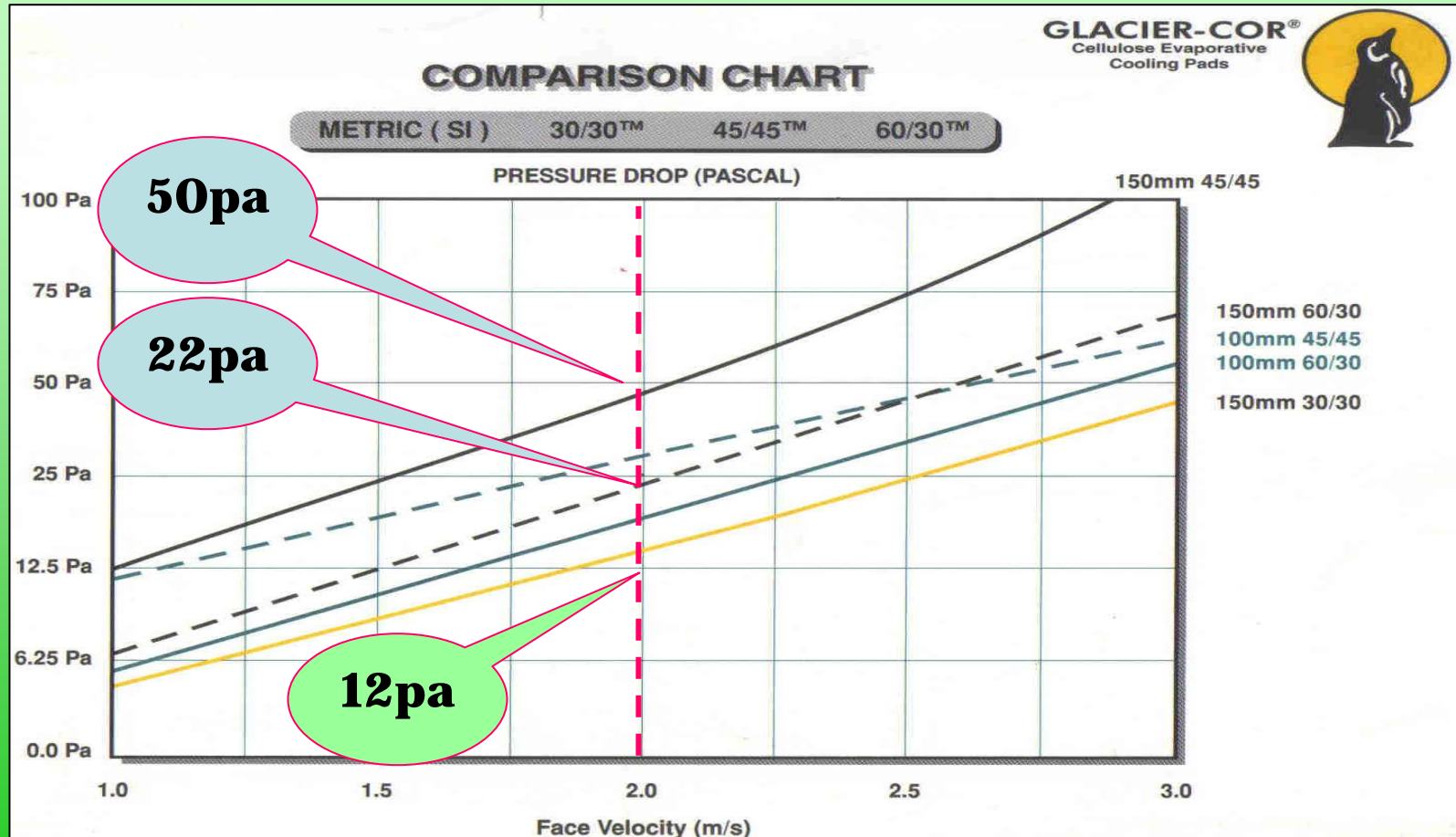
Two main different characteristics between types

- Quality of material and composition of pad.
- Flue angles (30/30, 45/45, 30/60)



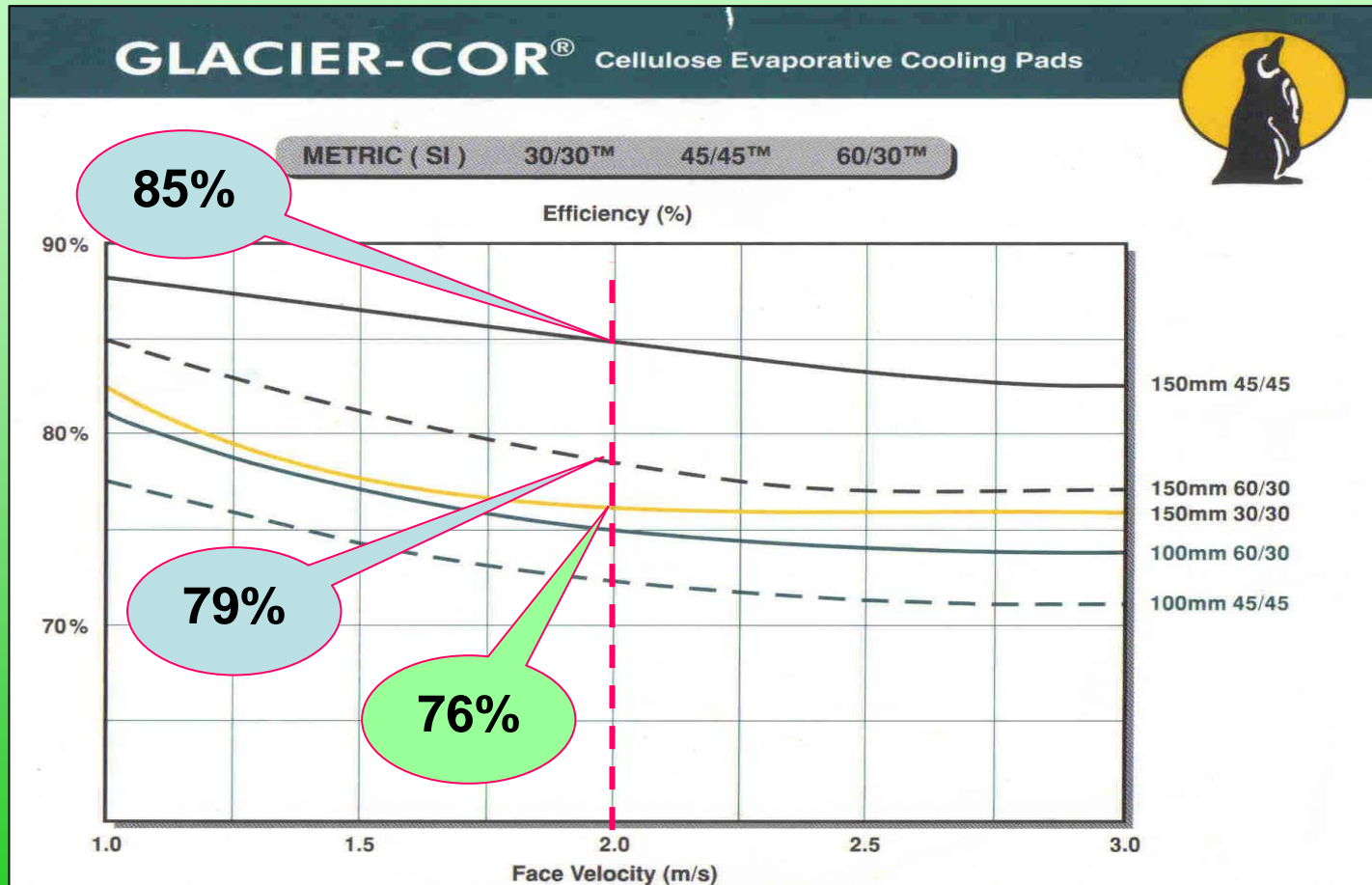
# Cooling System (Cooling pads)

Comparison chart of pressure drop between different pad types



# Cooling System (Cooling pads)

Comparison chart of efficiency between different pad types



# Cooling System (Cooling pads)

## Comparison chart of different pad types

Description	60/30	45/45	30/30
Resistance To Air Flow In 2 m/s (mm)	22	50	12
Cooling Efficiency	79%	85%	76%
Combined Efficiency	Reasonable	Very low	Very high
Assembly Simplicity	Complicated	Excellent	Excellent
Life Span	Long	Short	Very long
Changing Of Sides During Installation	Problematic	Possible	Possible

# Tunnel Ventilation - Fans

Main fan types in the market



50"

36"



50" Cone

# Tunnel Ventilation - Fans

## Major fan types in the market

Character	50'' fan	50'' Con fan
Air capacity at 40pa pressure	38,540	39,450
Electric consumption	1,600W	1,540W
Efficiency	43.4%	63.9%
Purchasing cost	Low	High
Maintenance	Simple	Complex

# Minimum Cross Ventilation

## Inlets types

Pullets light controlled inlet



Broiler / Breeder inlet



# Light Trap System

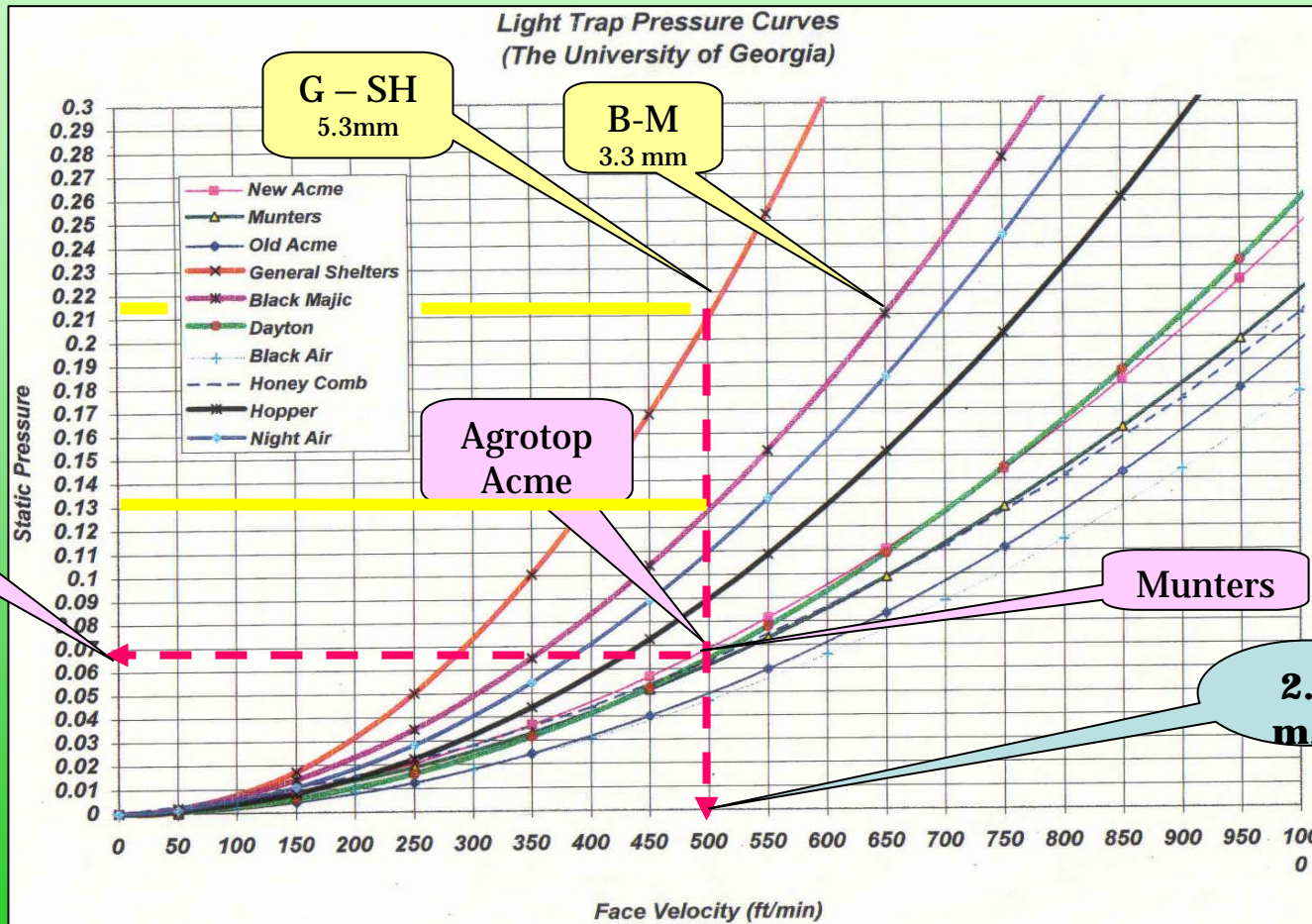
Three main characteristics are required

- Maximum resistance for light transfer
- Minimum resistant for air transfer
- Easy cleaning and maintenance



# Light Trap System

Light trap efficiency of air flow



FPM	M/S
50	0.3
100	0.5
150	0.8
200	1.0
250	1.3
300	1.5
350	1.8
400	2.0
450	2.3
500	2.5
550	2.8

1.65 mm

G - SH  
5.3mm

B-M  
3.3 mm

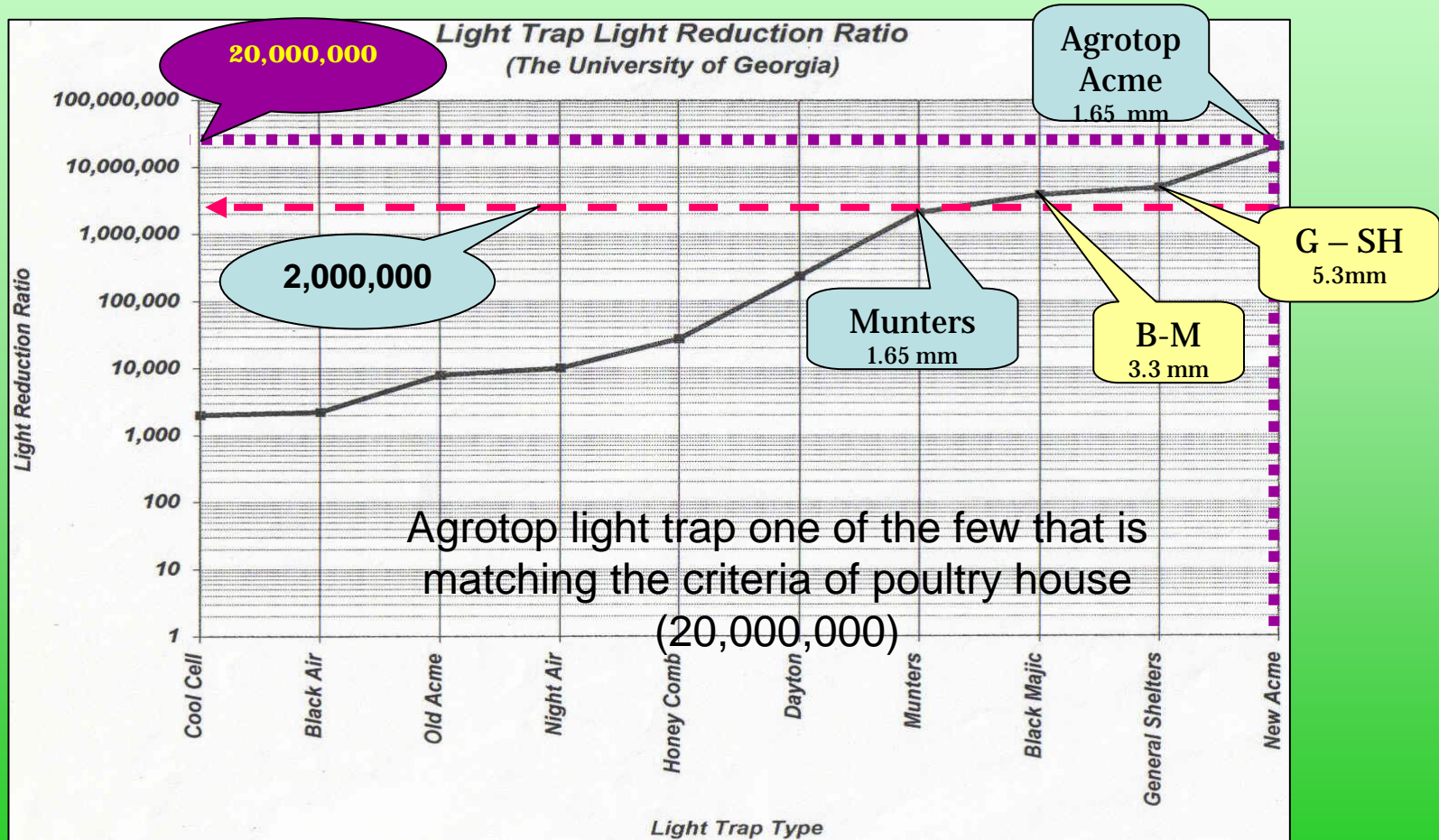
Agrotop  
Acme

Munters

2.5  
m/s

# Light Trap System

Light transfer resistance graph



# Light Trap System

## Easy maintenance and cleaning

The simple cleaning of light traps is important to ensure high level of Sanitation, the cleaning needed to prevent the development of diseases that will cost in low performance of the flock.

The accumulation of dust on the leafs cause damage to the light trap in various ways:

- Light reflection
- Decrease of ventilation efficiency
- Increase of maintenance cost of fans cooling pads etc.
- Higher electric consumption
- Increase of heat in the house and decrease of flock performance
- Escalating of dirt accumulation on the light trap

# AGROTOP



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