

Cannabis Production in SA



A bit of history



The most versatile plant?



Cannabis in the USA

1850s	Cannabis common in medicines
1925	Restrictions on cannabis in most states
1930	Federal Bureau of Narcotics established
1937	Marijuana Tax Act
1961	UN Single Convention on Narcotic Drugs

Cannabis in South Africa





1860s	Indian workers brought to SA
1870	Coolie Law Consolidation
1922	Cultivation, possession, sale and use of dagga prohibited

Legalisation



Timeline: USA

1991	San Francisco approves Prop P
1996	California approves use of medical marijuana
Today	All but 3 states allow medical use
2012	Washington and Colorado legalise recreational use

Timeline: SA

2010	Dagga couple arrested for possession
2014	Dr Mario Oriani-Ambrosini introduces Medical Innovations Bill
2017	Judge Dennis Davis rules laws disallowing cannabis cultivation and use are unconstitutional
2017	Medical Control Council report
18 Sept 2018	Constitutional Court upholds cannabis ruling
Sept 2020	Govt has 24 months to pass relevant legislation

Timeline: Southern Africa

2017	Lesotho becomes first African nation to legalise cultivation for export
2018	Malawi opens two pilot projects for hemp and MMJ
2018	Zimbabwe announces MMJ legalisation
2017-2018	Significant investments in Lesotho cannabis industry

Canada leads the way



Timeline: Canada

2001	Health Canada starts MMJ program
2013	New regulations allow cultivation and distribution by commercial companies
2018	Canada legalises recreational use and joins Uruguay as the only countries to fully legalise cannabis

Cannabis goes corporate

Canopy Growth Corp	Listed on the TSX and NYSE in 2018. Value US\$12 billion
Aurora Cannabis Inc	Value US\$11 billion. In talks with Coca-Cola
Tilray	Listed on the NASDAQ. Allied to Novartis and in partnership with AB InBev
Other Lesotho investments	Aphria buys a stake in Verve Dynamics/Canna Invest Rhizosciences buys Medi Kingdom

Legal Cannabis Spending (In Billions)

Rest of World
Canada
United States



Source: Arcview Market Research/BDS Analytics

Growing Cannabis



SATIVA

- + Tall in stature
- + Narrow leaves
- + Longer flowering cycles
- + Better suited for warm climates with a long season



Sativa

Aca

Acapulco Gold

Sativa

Pam

Panama Red

Sativa

Dp

Durban Poison

INDICA

- + Short in stature
- + Broad leaves
- + Shorter flowering cycles
- + Suitable for colder climates with shorter seasons



Indica

Hk

Hindu Kush

Indica

Mis

Mazar I Sharif

Indica

Afk

Afghan Kush

 **Leafly**

 **GROW-RITE**
nursery supplies

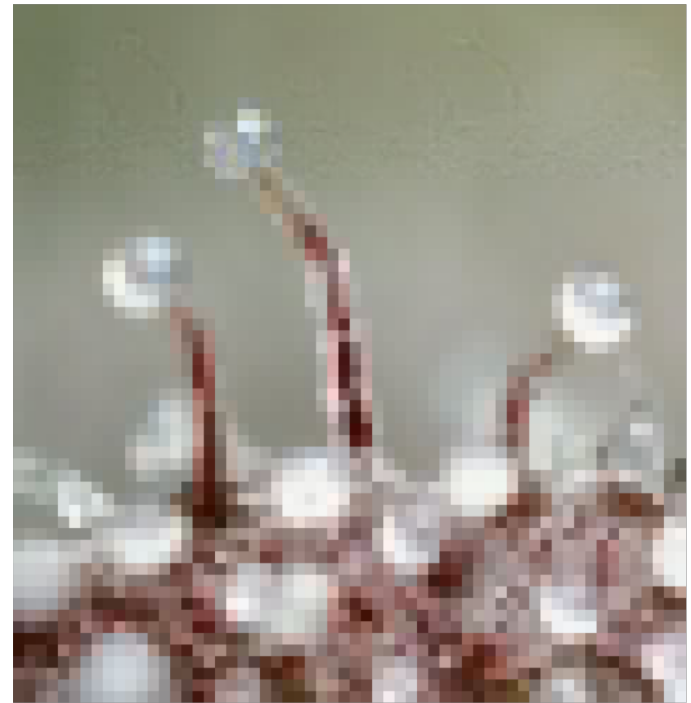
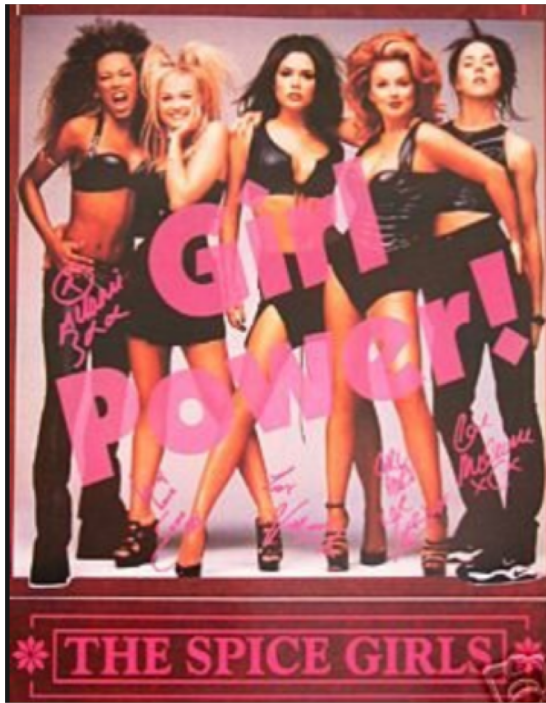

HYDROBIZ

Cultivation Points

- Prohibition forced growers indoors
- Genetics improved
- Cultivation techniques adapted and improved
 - Substrates
 - Water and nutrition
 - Ventilation
 - Lighting
 - CO₂



Girl Power



Seed vs Clones



Managing Mothers

- Maintain a photoperiod of 18 hours
- Use Metal Halide lights.
- High N, higher MgSo₄
- EC 1-1.2
- Maintain records and label plants



Making cuttings



Sticking cuttings



Rooting cuttings



Rooted cutting targets



Vegetative phase

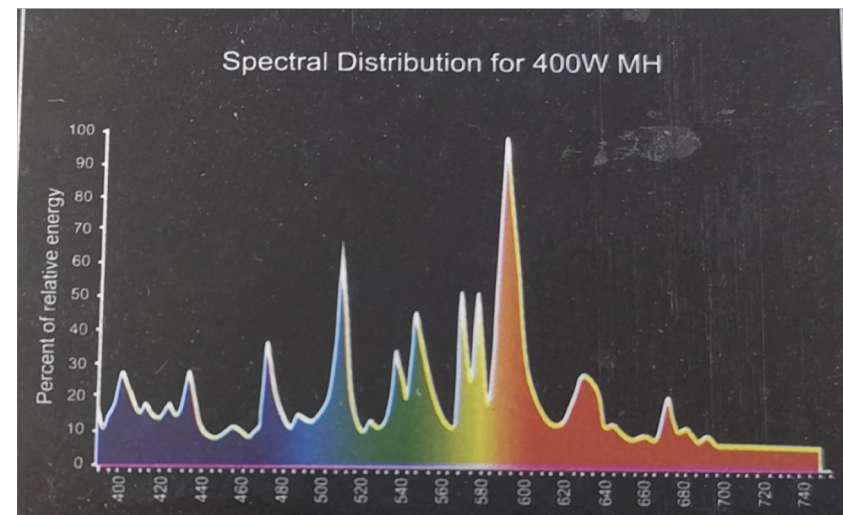
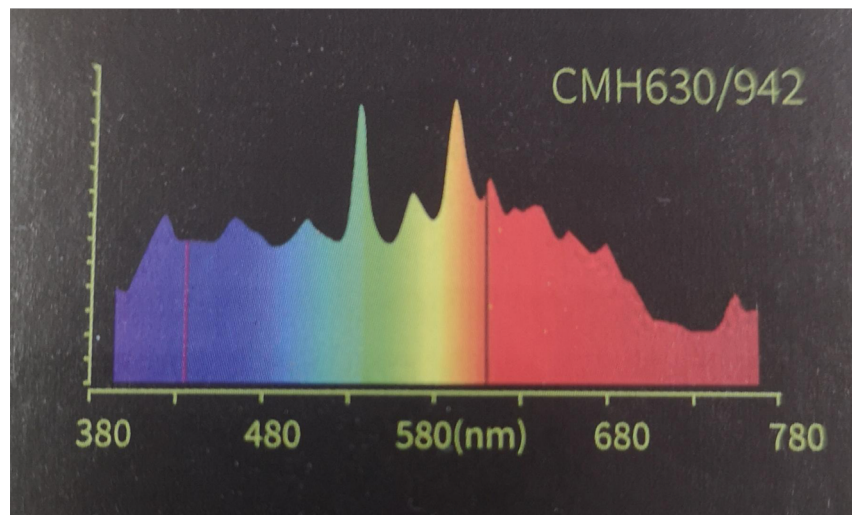


SOG vs Traditional



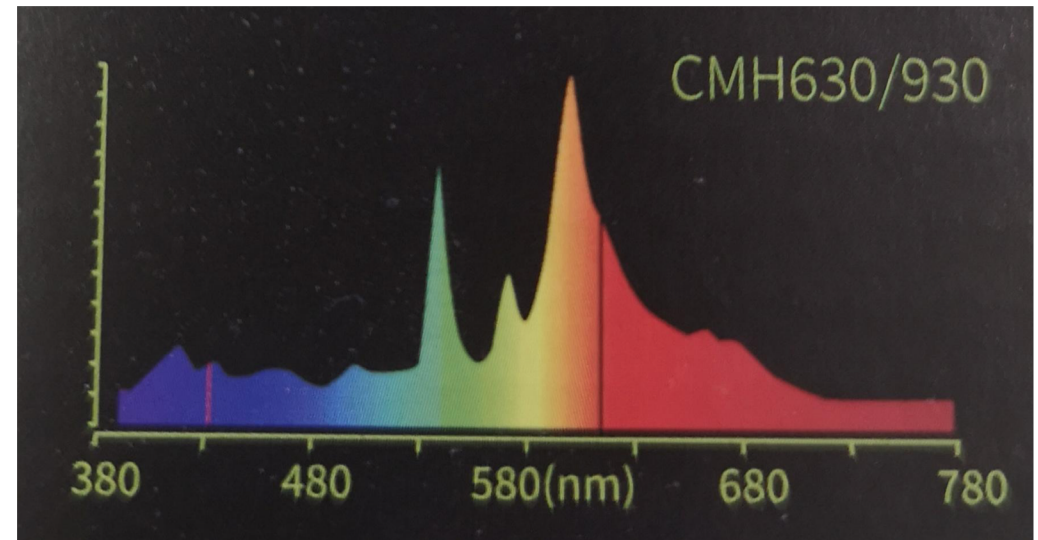
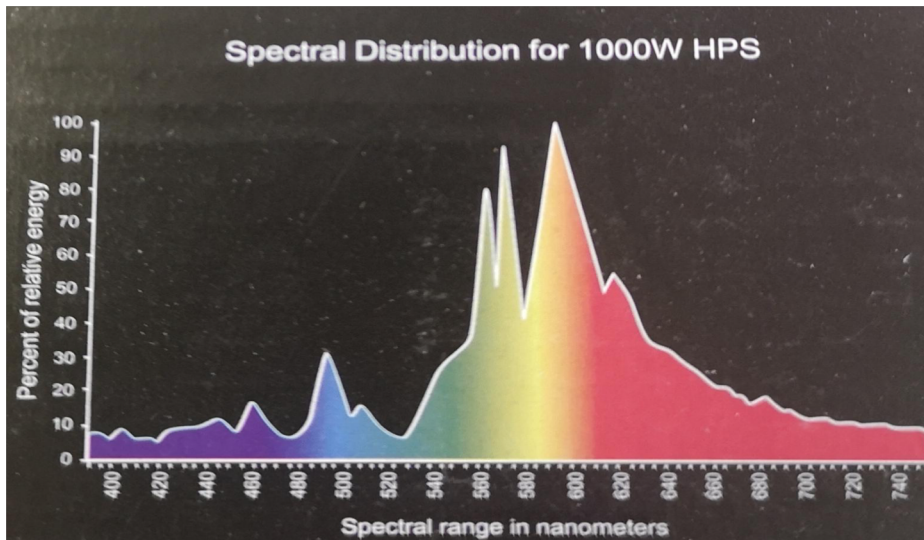
Lighting during veg

- Seedlings CFL
- Metal Halide
- CMH - 630/942



Lighting during flowering

- HPS
- CMH



LEDs

ADVANTAGES	DISADVANTAGES
Low cost per watt	High cost
Plug and Play	Penetration vs light intensity
Built in heat sinks	Lack of consistency
Customized light spectrum	Replacement parts
	Confusing claims

Substrates

- Hydroponics
 - DWC and DWRC
 - Rockwool and perlite
- Coir/peat/perlite
- Organic/soil



Importance of buffered coir



PROCESS OF BUFFERING

$$\begin{array}{c} \text{K}^+ \quad \text{Na}^+ \\ \text{Na}^+ \quad \text{K}^+ \end{array} + \begin{array}{c} \text{Ca}^{2+} \\ \text{(fertilizer)} \end{array} = \begin{array}{c} \text{Ca}^{2+} \\ \text{Ca}^{2+} \end{array} \begin{array}{c} \text{Na}^+ \\ \text{K}^+ \end{array}$$



Pioneering the Future

Cannabis home grower: Haifa Spliff Evaluation trials.

2019

Growing period 12- 14 weeks.

pH correction:

Always ensure that the water pH is kept between 5.5 – 6.5 for optimum uptake.

When acid is used to correct water pH, handle with care and please consult to determine correct levels.

1. Fertilisation program.

Product	Gram product per 10 L water													
weeks	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	Nursery	Vegetative			Budding - Bloom						Ripening		Finishing	
Haifa Spliff 1		7.5												
Haifa Spliff 2	5				10									
Haifa Spliff 3											5			
Haifa DUO	1.25	1.75			5						2.5			
EC (mS/ cm)	0.7	1.1			1.8						0.9		Clean water	

- Constant feeding regime.
- Change over to clean water during final 14 days of 'Finishing'.

2. Additional

- Monitor drainage water to ensure optimum pH and EC levels are maintained in the growing medium. Increase/ decrease irrigation amount accordingly.
- Warmer/ cooler growing conditions will affect irrigation frequency and volume.
- Additional growth regulator, hormone or stimulants were not taken into account. Continue with these as previously done.
- Regular plant inspections, evaluations and feedback would be required to ascertain correct fertilizer product composition and making further product formulation adjustments.

Water and Nutrition

- pH between 5.5 and 6.5
- Silicon is important - Builds cell walls. 2-3ml per 10L. Veg to flower
- Aminos 2-4ml /l Ratio of nutrients (2 at low)
 - Helps assimilate nutrients, carries metallic ions, helps, flavinoids
- Organic vs Chemical
- Molasses - mainly for feeding microbes and other nutrients
- Kelp - cytokinins and auxins



Ventilation

- LxBxH of growing space
- Air exchange 2 x per minute
- Use in+out fans to reduce pressure effect
- Negative pressure. Higher fan speed or volume fan on Out vs In



CO₂ enrichment

- Only beneficial in Veg
- Increases yield up to 20-25%
- Only if everything else is absolutely optimal
- Aim for 800-1200ppm
- Dangerous
- No ventilation required, uses AC or lungrooms

IPM

- Hygiene important
- Monitor the plants and room
- Use of poison and chemicals a no-no
- Use organic sprays only
- Fungus issues - use mycorrhizae
- Beneficial insects



Curing

- Flushing - drives last nutrients to flower.
- Cut - wet trim or dry trim.
- Dehumidifier - 60% humidity at 25 deg for up to 2 weeks
- Ready when you can snap the stem
- Store correctly



Why all the effort?

- Aim: 1 gram per watt.
- On SOG with 40 plants per m², can get up to 10 grams per plant
- Wholesale cost for indoor: R75-90 per gram
- Based on 4x4m room = 3.5kg = R250 000... But this is currently illegal!!!



Thanks!

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