



The Draughtsman's Contract (1982)

# Flax & Bamboo

## Pt. 1: A Casual Look

James Syrett

### What's Wrong With Cotton?

Cotton:

- High yield (875-1300kg/ha)
- Fine fibres
- Typically white – less bleaching needed
- Low processing required
- GM strains now available (*Bt*, glyphosate resistant)



### What's Wrong With Cotton?

- Water requirement – 500mm minimum, 700-1300mm optimal
- Minimum 20°C, 25°C+ ideal
- 9-10 hours of sunlight per day
- Long season: 145-175 days

Restricted to tropical and sub-tropical regions

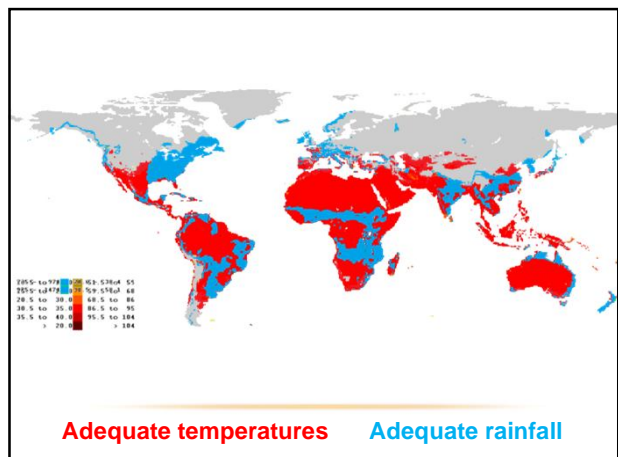
High chemical use (pesticides and growth regulators)

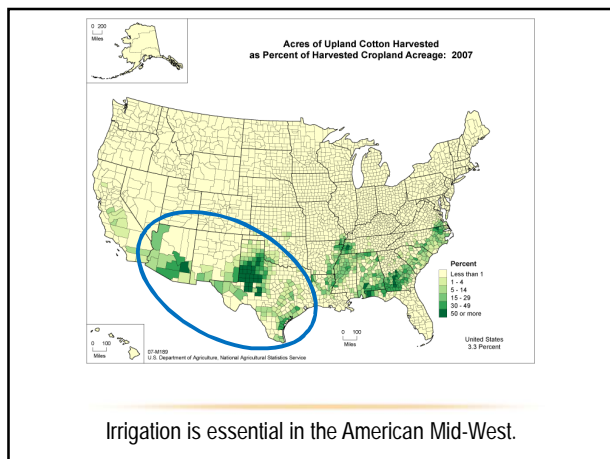
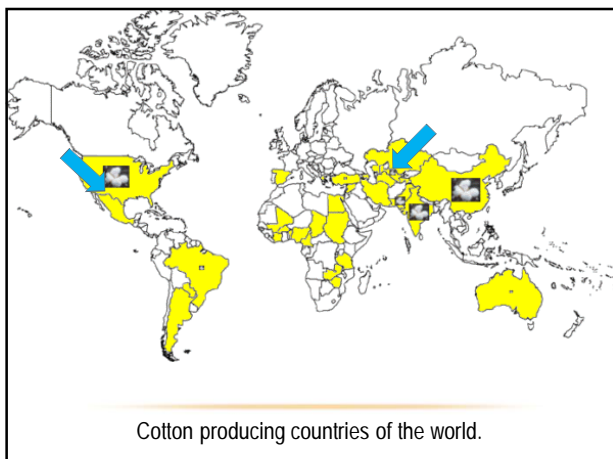
### The Permanent Solution

Polyester (invented in 1941) has similar properties to cotton.

- Soft feel
- Easy to iron
- Does not need land to produce

So why not use it instead?





### The Cool Summer Crop

Flax (*Linum usitatissimum*).

Fibres extracted from the stems.

Woven flax is referred to as **linen**.

Yields 2-3 t/ha fibre.\*  
Price \$250/t (2013 price).\*

Also an oil crop.

\*Source: ncagr.gov, 2013

### A Heritage Crop

First evidence of flax fibre use 30,000 years ago in Georgia.  
(Compare: 6000 years ago for cotton.)

Used for mummy bandages in Ancient Egypt.

Commercial production began in 1753

### A Heritage Crop

Linen products

Christien Meindertsma has designed a chair made of flax fibres reinforced with a natural resin. The chair is fully biodegradable.

### Growing Conditions

Tolerant of a wide range of soil types.  
Needs good drainage.  
pH 5.5-8.0  
~100 days to maturity (March-July)

### Growing Conditions

Top flax fibre producing countries:

- Canada
- Russia
- Ukraine
- France
- Argentina
- Italy
- Germany
- Netherlands
- Belgium
- UK & Ireland

### Establishment

Seeds ~3mm length  
Drill 1-3cm depth  
Final stand 300-450 plants/m<sup>2</sup>  
(Sow 800 seeds/m<sup>2</sup>)  
Dense planting reduces weed problems.

### Low Investment

Water footprint is less than half that of cotton.  
Hemp, jute, and sisal are lower still (more next week).

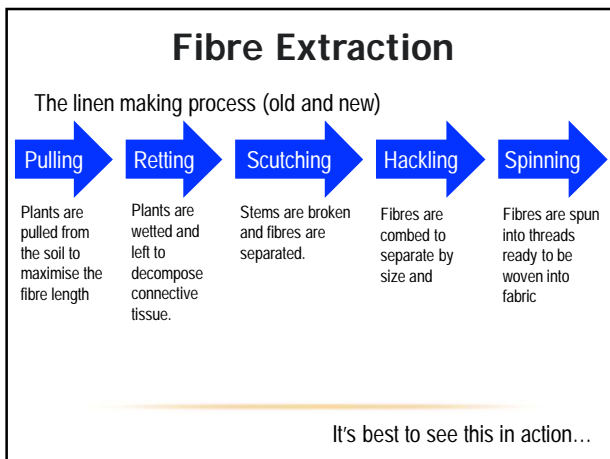
FAOSTAT crop code	Product description	Global average water footprint (m <sup>3</sup> /ton)			
		Green	Blue	Grey	Total
328	Seed cotton	2282	1306	440	4029
	Cotton seeds	755	432	146	1332
	Cotton lint	5163	2955	996	9113
	Cotton linters	1474	844	284	2602
	Cotton-seed oil, refined	2242	1283	432	3957
773	Flax fibre and tow	2637	443	401	3481
	Flax fibre, otherwise processed but not spun	2866	481	436	3783
	Flax tow and waste	581	98	88	767

Source: UNESCO

### Low Investment

Low chemical inputs  
N – 90kg/ha maximum  
P – None  
K – 90kg/ha maximum (K<sub>2</sub>O)  
Fungicides necessary  
Minimal insecticide needed.

Source: UNESCO



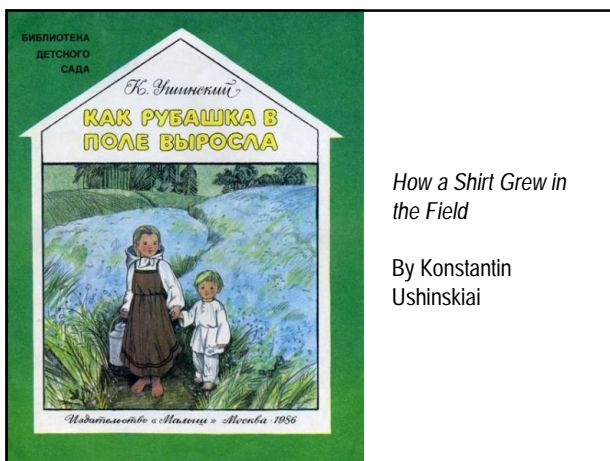
### Fibre Extraction (Old)

Traditional linen making

Fibres pulled by hand.  
Left to ret in the dew or by soaking in water.  
Scutched by breaking with clubs or a 'flax break'.  
Combed with a hackle.

Long fibres are called 'line', short fibres are 'tow'

<https://www.youtube.com/watch?v=TFuj7sXVnIU>



### Fibre Extraction (New)

Modern methods:

Crop pulled by bespoke harvester.  
Retted on the ground or by steam cooking.  
Broken and scutched by steel rollers.  
Hackled by rotating combs.

<https://www.youtube.com/watch?v=-ZrZZefkohE>

### Colourful Issue

Most raw flax fibre is grey or buff.

High quality flax is off-white

Requires bleaching before it can be dyed.

Bleach is a pollutant of waterways.

### Sustainability

Pros	Cons
Low NPK	Roots pulled – soil erosion
Low water	Still competitive for good quality land
Low insecticide	Bleach needed



## Flax

Why not use it instead of cotton?

Creases easily – needs ironing.  
Hard to iron flat panels or sharp corners.

Hard to create formal clothes.

Do we need a fashion change?



## End of Part 1