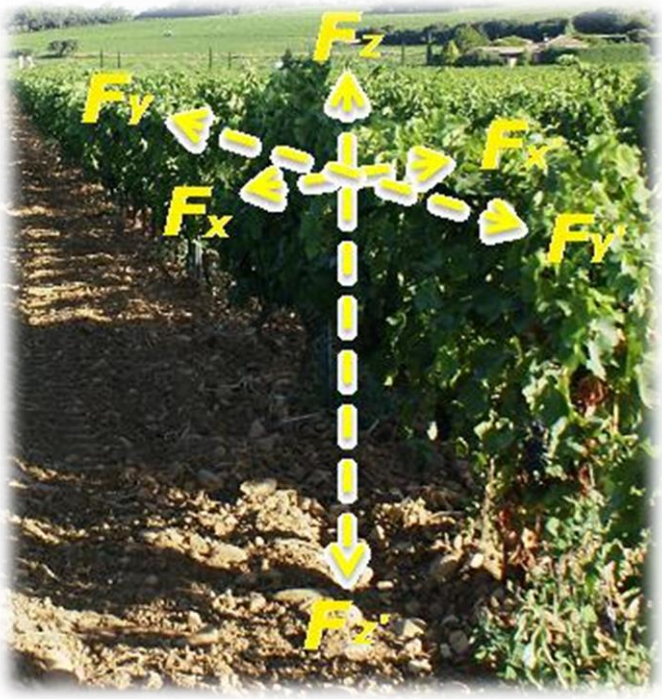
C.E.P. - CONSULTING

Proposes to you a groundbreaking concept

wich combine

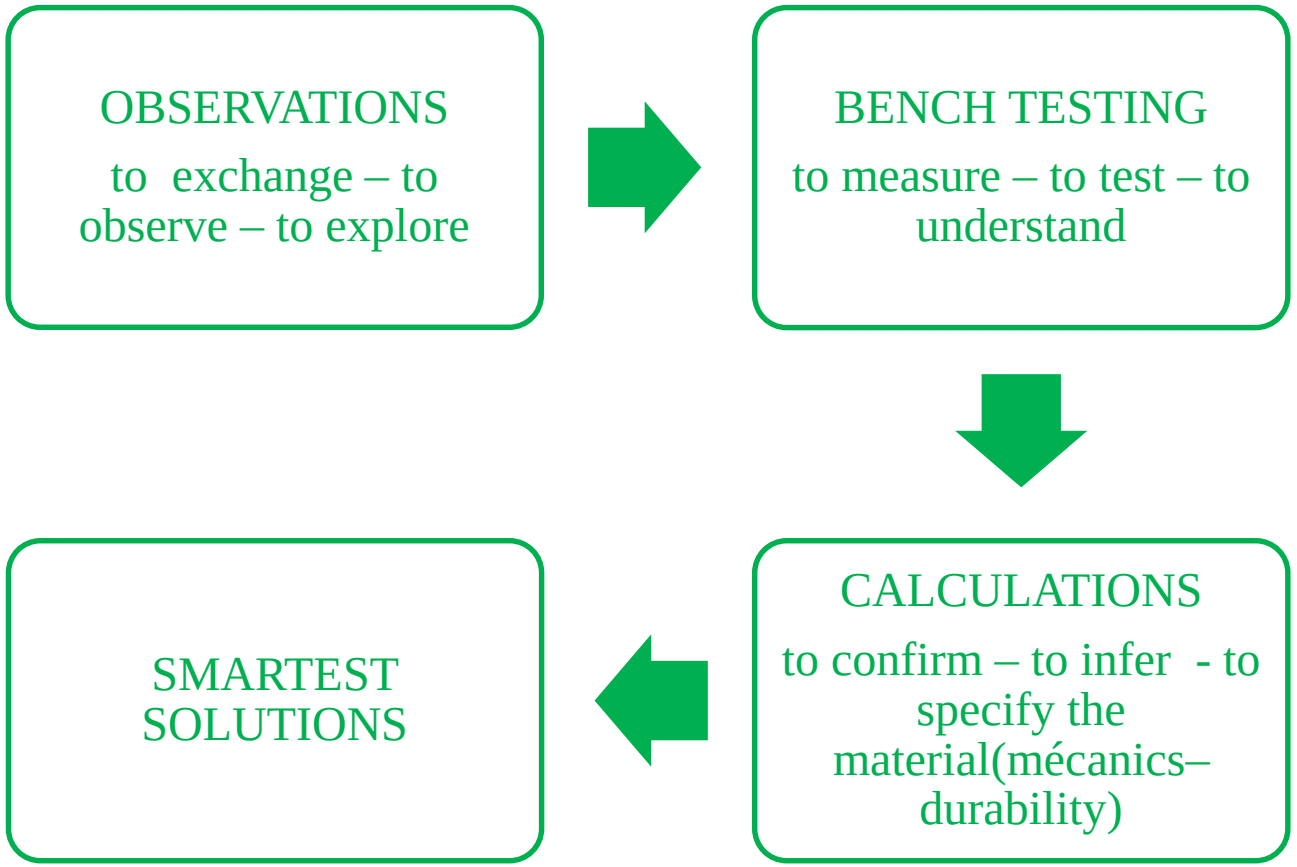
- observation,
- bench test,
- physics,

In order to design a scientific trellis system



September 2010

LE CONCEPT


OBSERVATIONS
to exchange – to observe – to explore
BENCH TESTING
to measure – to test – to understand
CALCULATIONS
to confirm – to infer - to specify the material(mécanics–durability)
SMARTEST SOLUTIONS

OBSERVATIONS
on post and shoot shape

With observation you can see	
What you have to do	**What you must evoid**
 	

Post observation and shoot shaping

OBSERVATIONS

Observation of the strains on the wires

OBSERVATIONS

Observations on the nails fixation

OBSERVATIONS

Observation about misshapenness of the streamlined posts

OBSERVATIONS

Rusting observation

Measures of zinc losses in all the french areas in all the types of soils

OBSERVATIONS

Observation on the head of post








EXPERIMENTATIONS
on the posts

The expérimentation enable you to understand better the behaviour of the post and the wire, to confirm the formulas of calculations of the structures and infer at all the situations

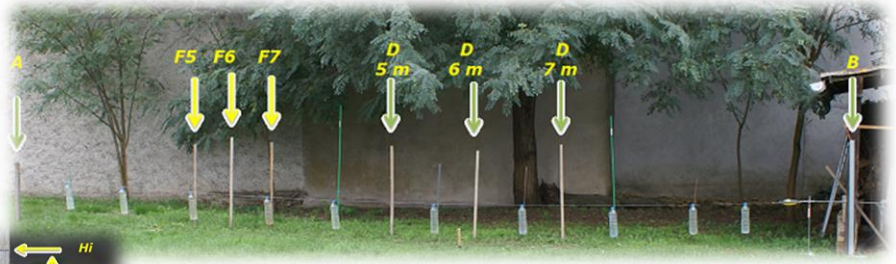
Measures of flexibility

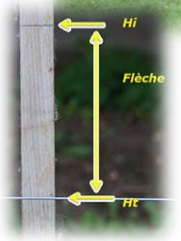
		ACIER CRANTE		
KG	N	8		
	R		4	
	I		2E-05	
	E	170000		
FORCE		MESURE	CALCUL	ECART
3	29.43	0.4	0.37	-3 mm
6	58.86	0.8	0.74	-6 mm
9	88.29	1.2	1.12	-8 mm
12	117.72	1.5	1.49	-1 mm
15	147.15	1.9	1.86	-4 mm

Interaction betwieen post bending and weight bearing wire

Comparison : measures – calculations => Formulas validation

EXPERIMENTATIONS
on wire





Measures of the sag

Strain measures regarding wind

Vent 600 pascal = vent de : 113 km/h

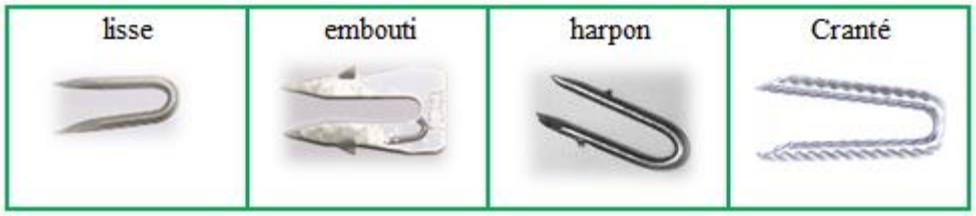
CHARGES H	194.40	MESURE	CALCUL	ECART
		20 kg	20 kg	0.06 kg

Comparison : strain measures– calculations
=> formulas validation

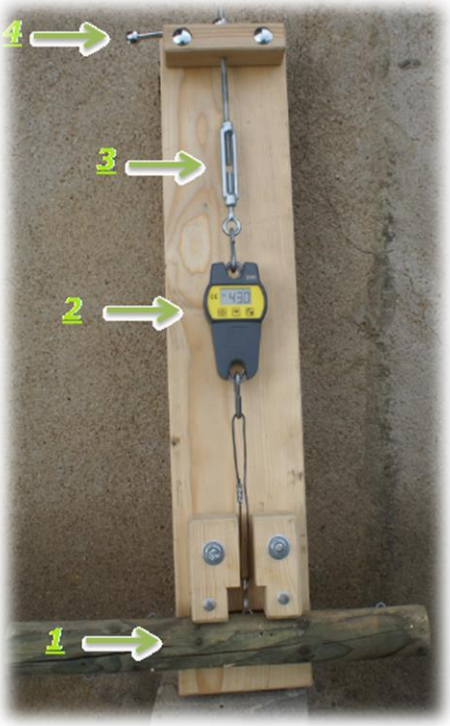
Distances (m)	Mesure (cm)	Calcul	ECART
7	9.6	9.188	-0.4 cm
6	7.3	6.750	-0.5 cm
5	5.1	4.688	-0.4 cm

Comparison :sag measures – calculations
=> formulas validation

EXPERIMENTATIONS
on nails



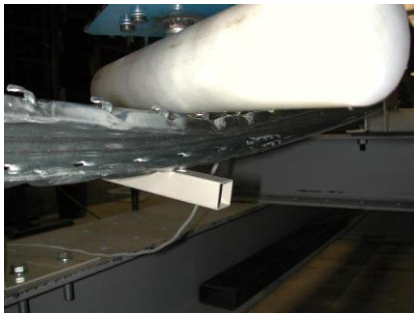
Resistance comparisons
Between vertical or tipped bearing



Measures résistances to the wrenching

EXPERIMENTATIONS
on posts

Twisting measures

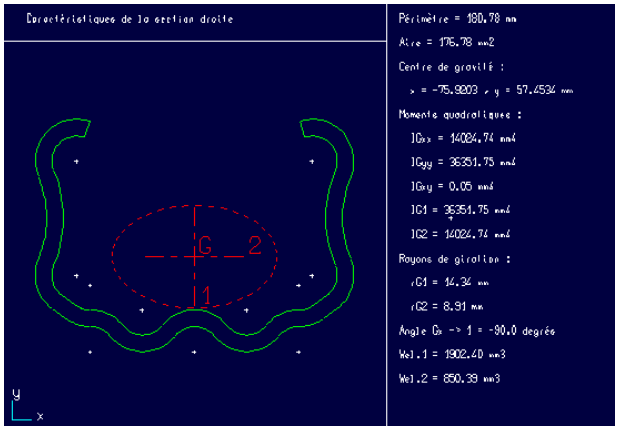


Destruction test

	Piquet	Piquet
Longueur piquet hors sol	1.5 m	1.4 m
Effort vertical Fz	214	214
Effort horizontal Fx	181	161
Calcul contraintes / capacités du piquet à les encaisser	103%	84%

Calculations of résistances

Mesures of
résistances of the bracket



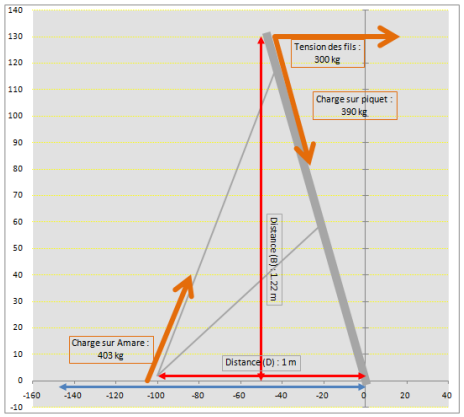
Calculations of the mechanical
charcateristics

EXPERIMENTATIONS
on the anchored end post

Rivolet

Cogny

Alix



Calculations of the strains

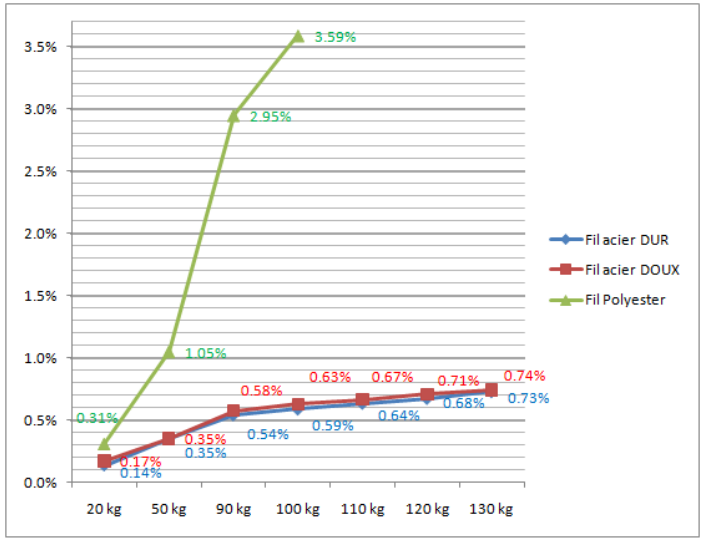
Calcul des efforts	RIVOLET	COGNY	ALIX	
sur le piquet	531	187	398	kg
sur l'amarre	578	195	400	kg
calcul de la hauteur verticale (A)	1.10	0.83	0.93	m
Rapport Distance (6) / hauteur (A)	53%	117%	75%	%

Comparison : strains - positions

OTHER TESTINGS

Load tets between 2 pressure points

Measures of installation time



Extension test on wire

Breaking point test

Realised in collaboration with Arts & Métiers

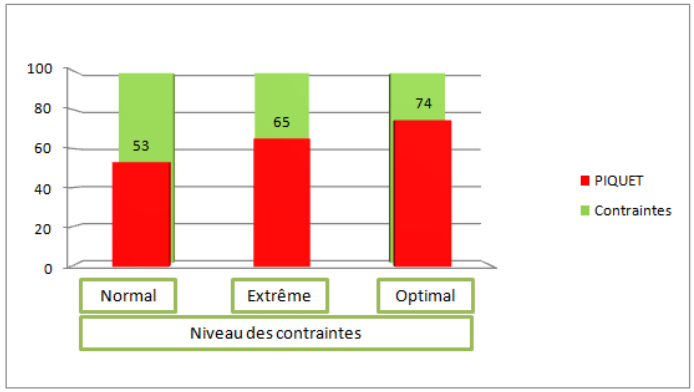
OPTIMIZED SOLUTIONS

These observations, tests, physical calculations, studies about times (installation,, réparation, works, durability) enable us

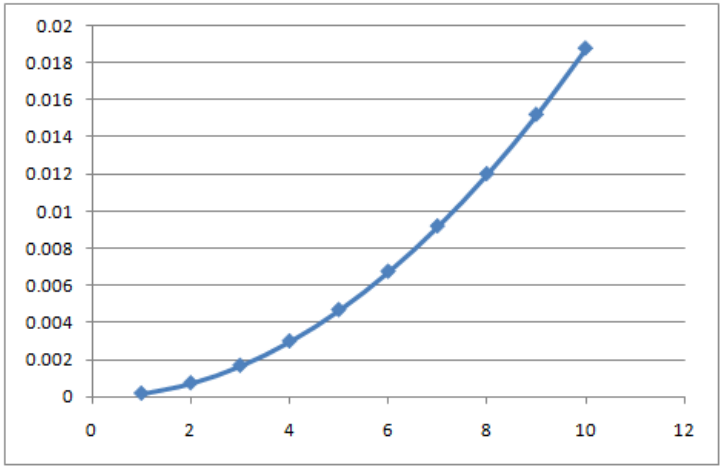
- to delimit accurately all the parameters of the different materials in regards of their capacity to sustain the constraints of the vineyard

- to propose technico économics optimized solutions

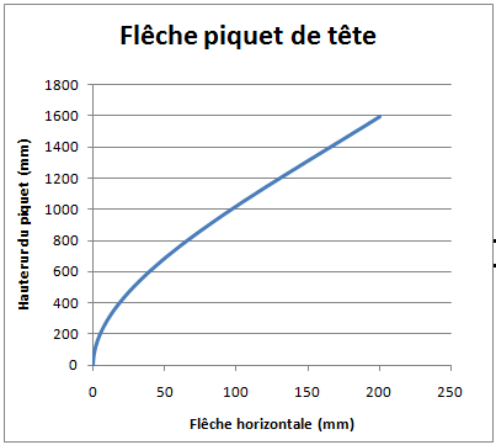
OPTIMIZED SOLUTIONS



Size adaptation of posts to the constraints



Size adaptation of the wire to the constraints



Size adaptatio of the anchored end post to the constraints

	CHOIX 1	CHOIX 2
Cout total / HA des matériaux :	**1 947 €**	**2 565 €**
Piquets :	1 881.00	2 565.00
Accessoires :	66.38	
Cout total / HA de l'installation	**1 859 €**	**1 425 €**
Cout main d'œuvre / HA	434.29	
Cout de plantation / HA	1 425.00	1 425.00
Nombre de piquets / an à remplacer	38	9
Cout annuel du remplacement	**192 €**	**53 €**
COUT TOTAL SUR LA DUREE DE VIE DE LA PLANTATION : (soit 40 ans)		
COUT TOTAL	**11 482 €**	**6 096 €**

Technico economical comparison(products + workforce

PRESTATIONS

C.E.P. – Consulting proposes :

- ✓ Professionnal training
- ✓ Counsels and guidelines for pallis set up
- ✓ Input curtailment strategy
- ✓ Technical and economical analysis
- ✓ Expertise for the study of new solutions
- ✓ Trellis system modelisation
- ✓ Specifications redaction
- ✓ Conformity controls
- ✓ Installations follow up

C.E.P. – Consulting works at the international level

With the technical institutes, chambers of agriculture, wine-producing cellars, wine advisors and the wine growers

C.E.P. - CONSULTING

«Taken as a whole, the constraints détermine the level of the strains than the equipment must sustain in the course of time »

C.E.P. est le 1° private consulting company neutral and independent for Counsel and Bench testing in trellis systems

C.E.P. – Consulting

Jean – Marie LECLERCQ

165 Petit Chemin de Bordelan 69 400 Villefranche sur Saône - FRANCE

Tél : 06 70 01 72 58 **Email : jml.leclercq@orange.fr**