

Production: PEPPERS

Objective: Skin puncture strength of different coloured peppers using a Cylinder Probe

Type of action: Penetration test

Test mode settings:

Speed	Test mode	Trigger	Target	Hold
2 mm/s	Distance (c)	25 gf	12 mm	0 sec

Accessory:

φ 3 mm cylinder probe, Platform

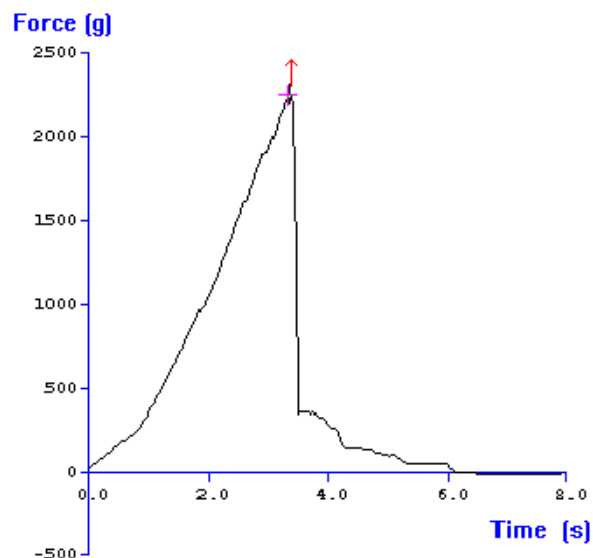
Sample Preparation:

Cut fresh peppers longitudinally into strips of constant length. Remove the curved ends of each strip and the white spongy internal material to obtain as flat a sample as possible.

Test Set-Up:

Place the Heavy Duty Platform onto the base of the machine. Insert the holed plate into the Heavy Duty Platform and tighten the screws. Lower the probe so that it passes centrally through the hole of the plate. Secure the Heavy Duty Platform in this position. Raise the probe to allow the placement of the sample on the holed plate. Position the sample centrally on the holed plate and commence the test.

Typical plots:



The above curve was produced from testing a strip of red pepper (25mm x 75mm x 3mm)

Observations:

Once the trigger force of 25g is attained the graph proceeds to indicate the flattening of the sample due to its curved structure (initial gradient). The gradient following this indicates the yield modulus of the sample up to surface penetration (shown as the absolute force peak and often referred to as the 'bio yield point'). Following surface penetration the force drops considerably whilst continuing to penetrate the lower tissues to the required depth (e.g. 12mm).

Data Analysis:

☒ Max Force

Results

Pepper Type	Mean Max. Force 'Skin puncture force' (+/- S.D) (g)
Red	2370.6 +/- 102.1
Green	2276.3 +/- 196.7
Yellow	1253.0 +/- 78.8

Notes:

- It should be noted that when testing fresh peppers the following must be considered:
- Factors affecting the mechanical properties of the pepper -
- Degree of ripening
 - Age of the fruit after harvest - loss of moisture will occur with time causing the surface to become elastic due to loss of cell turgor.
 - Genotype of the fruit - this is the major limiting factor when comparing fruits of the same phenotype, i.e. one red pepper may be genetically different to another red pepper, resulting in differences in skin formation. It is for this reason that when examining the following application study, account must be taken of the genotype of the particular pepper grown.
- When attempting to optimize test settings it is suggested that the first tests are performed on the hardest samples to anticipate the maximum testing range required and ensure that the force capacity allows testing of all future samples.