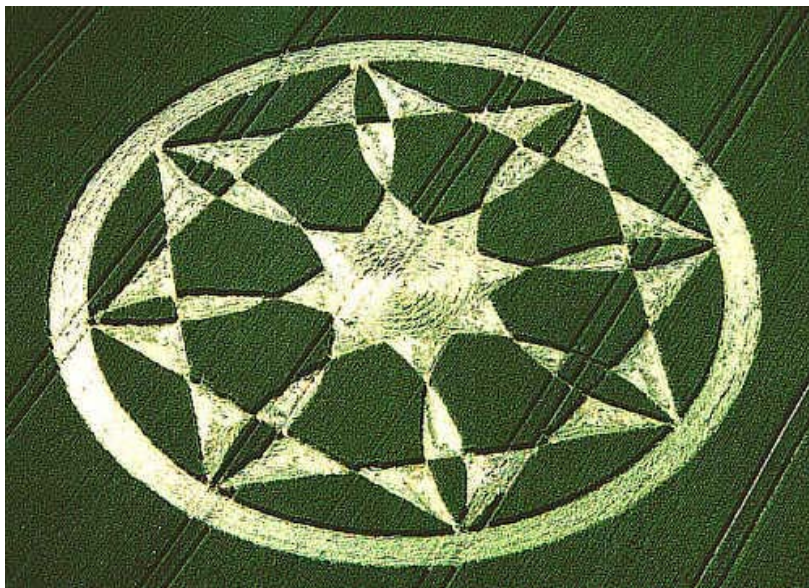


RECONSTRUCTION OF A CROP CIRCLE "CROP CIRCLES CHALLENGE"

Crop circles (in French : les agroglyphes, in German : Kornkreise) are geometric, non-geometric or random figures in crops or vegetation. They appear in the form of one simple circle, multiple circles or more extensive and complicated patterns. The dimensions of crop circles differ too. Simple circles can have a diameter of just a few metres but the more complicated patterns can be as big as several football fields. These figures are most commonly witnessed in the South of England, in areas close to old places of worship like Stonehenge or Avebury.

The picture below is a corn circle found on 27 June 2000 in Bishop Cannings, Wiltshire, England.



Crop circle photo courtesy (www.cropcircleconnector.com)

Many patterns of crop circles show such an intriguing structure that they are simply waiting to be discovered. The purpose of this article is not to find out how crop circles are being made. The internet offers a lot of information (but unfortunately also a lot of nonsense) on this subject. Theories about the origin of the circles differ : some see them as messages of aliens, others think they are produced by well organised circlemakers (hoaxes), still others think they are the result of exceptional weather conditions.

This article concentrates on the mathematical patterns that are hidden behind the crop circle structures and wants to support the willingness to discover the underlying mathematical patterns that enhance the fascination for the artistic beauty of the patterns.

“Construction with compass and ruler” seems to be a particularly efficient tool for these reconstructions but modern geometry software offers us precision, unknown before. One thing cannot be denied : the makers of crop circles must have a sound knowledge of geometry.

On the next page the Bishop Cannings circle is being meticulously reconstructed, step by step, using the GeoGebra geometry software.

<p>Draw a circle.</p>	<p>Draw 4 centerlines at 45°.</p>	<p>Construct two squares.</p>
<p>Draw eight circles, centered at the corners of the squares, and passing through the adjacent corners.</p>	<p>Construct two larger squares through the corners of the smaller ones as shown.</p>	<p>Construct a large octagon by connecting the corners of the larger squares.</p>
<p>From the endpoints of the centerlines, construct again an octagon, inscribed in the large one.</p>	<p>The outer border of the ring is formed by a circle, inscribed in the octagon of the previous step.</p>	<p>Construct the arcs as shown and remove all the superfluous parts</p>

Try to reconstruct another crop circle in a similar way. Note down all the steps you take and use GeoGebra. It can be downloaded, completely free of charge, from www.geogebra.at.

The most interesting creations might be published on the websites of the European Com@net project, <http://www.vivante.it/com@net>, <http://www.math.be> or <http://users.sch.gr/dkastani/encrop.html>