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**FARMING IN PROTECTED LANDSCAPES FUND**

Raise the Roof Hemp Group



Project Report

Prepared for: Wessex Community Assets

Prepared by: David Dixon

March 1, 2022

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## EXECUTIVE SUMMARY

The Raise the Roof Hemp Group came about following initial discussions with local farmers and landowners about the availability of natural materials for use in the construction sector. It became apparent that due to historical associations between West Dorset and Flax/Hemp growing there was a latent interest in hemp as a new 'cash crop'. Anecdotally it is known that there are positive impacts to be derived from hemp cultivation; such as soil health, carbon sequestration and 'biodiversity net gain'. A grant request to the Dorset AONB Farming in Protected Landscapes grant fund (FiPL) was successful and led to the activities described in this report.

Whilst the benefits of Hemp is widely celebrated and offer huge potential opportunities for a "new" cash crop for British farmers, enhancing the supply of local textiles and construction materials, there is little evidence available to Farmers and growers to provide the confidence required to including hemp in rotations.

As the UK is transitioning from the EU CAP into the new Environmental Land Management scheme, Wessex Community Assets (WCA) could see benefits from supporting local farmers to explore the potential of Hemp growing and provide the evidence and support required to move to establishing field trials of the crop in West Dorset conditions.

### **With FiPL Funding the RtR Hemp Group:**

- Brought together a study group of local farmers, landowners and contractors to explore the benefits and constraint of hemp as a 'break' crop in regenerative agricultural systems;
  - Collated information on growing, harvesting and processing hemp;
  - Worked with the farmers to develop a Phase 2 funding bid to FiPL to support 4 hemp field trials;
  - Connected farmers to users of hemp in construction projects;
  - Connected local Farmers to Uk wide hemp research; including the Innovative Farmers network.
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# 1. FACILITATING A FARMER GROUP TO INVESTIGATE THE GROWING, HARVESTING AND PROCESSING OF HEMP

## Background

Wessex Community Assets (WCA) is leading a two year project called “Raise the Roof” (RtR). With support from the Friends Provident Society Raise the Roof is looking to promote:

- Regenerative land management through sustainable agriculture and forestry. Relevant to farmers/foresters/landowners by addressing the climate/ecological crisis while creating viable business opportunities – producing materials for the local market.
- Zero carbon construction through encouraging supply of local materials and prototype build projects. Relevant to architects/builders/craftspersons/designers by supporting the industry wide shift to net zero construction with clients increasingly asking for different designs and natural materials.

## Purpose of the RtR Hemp Study Group

As a sub project of RtR and with match funding from FiPL, the RtR Hemp Group aimed to bring together Farmers/Landowners in the Bridport Area to explore the economic opportunities of growing and processing hemp as a natural building material. In particular, to connect to the opportunities for low carbon building materials required to construction the 1000 new homes allocated in the Bridport Area.

## Outputs from the RtR Hemp Study Group

Working to the enquiry lines defined at the first meeting the Group aims are to:

- Provide information and explanation about the growing and processing of Hemp with a view to supporting field trials of hemp planting in Spring 2022;
  - Provide information and explanation about Hemp as part of a regenerative agriculture response in the Bridport Area;
  - Explore issues around Hemp processing and develop a business case for co-operative/ social enterprise solutions in the Bridport Area;
  - Explore opportunities for connecting growers to opportunities for wider uses of Hemp in other products linked to the construction of new homes in the Bridport Area.
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## Who Has Been Involved?

The RtR Hemp Group project has brought together the following farmers, landowners and contractors:

Farmer/Landowner/ Contractor	RtR Hemp Group Attendee:
Coppett Hill Farm	Ellen Streatfeild Amanda Streatfeild George Streatfeild
Crutchely Estate	Victor Crutchley Anthony
Symondsburry Estate	Philip Colfox
Graston Farm, Burton Bradstock	Andrew Bailey
Racedown Farm, Marshwood	Ross Dickinson
Hemp Processing specialist	Ian Underhay
Huxter Contractors	Albert Huxter Martin Huxter
Dorset Wildlife Trust	Nick Gray
Dorset AONB	Tom Munro Ian Rees

## WCA Team supporting the RtR Hemp Group:

David Dixon  
Tim Crabtree  
Lucy Beasley

## Note on the Impact of the Covid-19 Health Pandemic

Delivery of the Hemp Group ambitions were impacted by the Covid 19 health pandemic. Whilst the Group did manage to meet regularly – Outdoor at the Old Pottery, Symondsburry \* – Farm visits were not able to take place and speakers joined the Group via Zoom.

*\* Thanks go to Philip Colfox and the Symondsburry Estate for providing meeting space and chocolate brownies for the Hemp Group.*

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## 2. WHAT DID THE HEMP GROUP SET OUT TO ACHIEVE?

### Stated Objectives

- Deliver workshop sessions to explore sowing, harvesting and processing hemp.
- Agree field trial plots with farmers covering a range of conditions and sowing/harvesting methods.
- Specify and secure quotes for harvesting & processing hemp contracts.
- Apply for all Permissions and Licensing costs (covered by match funding).

### Phase 1 Research and Development - end point March 2022

Monthly meetings were scheduled to connect the RtR Hemp Group to national expertise and practice around growing, harvesting and processing hemp. Industrial Hemp is a controlled crop and the farmers need to apply for Licenses to be able to undertake planting in 2022.

Support was provided to:

- Access research on methods of hemp cultivation practices for optimal crop quality and yield;
- Agree a series of field trials across different farm types;
- Secure licenses for all farmers looking to participate in the Hemp field trials.

**All research and information generated by the RtR Hemp Group will be made available through the WCA Website and the Raise the Roof Project social media. Following delivery of the FiPL grant fund WCA, through the The Raise the Roof project, will look to host workshop sessions to bring together various stakeholders in the hemp supply chain to understand and respond to the opportunities highlighted through this project for transition to more regenerative agriculture.**

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### 3. HOW THE SUPPORT FROM FIPL FUND WAS SPENT?

#### Financial Summary

The outline financial summary for RtR Hemp Group is shown below.

<b>Expenditure Cost heading</b>	<b>Agreed budget</b>	<b>Final cost</b>
WCA facilitation of Hemp Group meetings	5900	5900
Home Office checks & licensing costs	3,100	3,100
<b>Total</b>	<b>9,000</b>	<b>9,000</b>

<b>Income</b>	<b>Agreed budget</b>	<b>Final cost</b>
WCA Raise the Roof	4200	4200
Phase 1 FiPL Grant	4,800	4,800
<b>Total</b>	<b>9,000</b>	<b>9,000</b>

#### Notes and observations on the expenditure & income tables:

- Overall RtR Hemp Group Phase 1 Grant was delivered to the agreed budget;
  - The Home Office application window for Hemp licenses opened in January 2022 and WCA have submitted the first stage application on behalf of the four landowners. The Issuing of licenses to each landowner will take place at the end of March/ Early April;
  - An order for hemp seed has been placed by WCA to cover the 4 field trials.
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## 4. RTR HEMP GROUP: SUMMARY OF LEARNING OUTCOMES

### **Growing Hemp:**

RtR Hemp Group held an online Q&A session with Jon, a tenant farmer working on a 400 acre holding on the Dartington Estate, Devon. He has grown Hemp for seed on contract for 3 years.

Jon explained to the RtR Hemp Group the key Issues to consider when sowing and growing Hemp - Hemp doesn't like frost. It impacts on germination. The consequence of uneven germination on density of crop and vulnerability to storm and bird damage nearer to harvesting. Jon recommended drilling as "early as you dare". A further conversation with a farmer in Wiltshire who had grown an experimental 2 Ha crop of Hemp in 2021 provided useful insights (see Appendix).

**PLANT DESCRIPTION:** Hemp is an annual, herbaceous plant with a slender stem, ranging in height from 4 to 15 feet and a diameter from 0.25 to 0.75 inches. The innermost layer is the pith, surrounded by woody material known as hurds. Outside of this layer 'is the growing tissue which develops into hurds on the inside and into the bast fibres on the outside. The stem is more or less branched, depending on the crop density. When sown thickly the stems do not branch. The leaves are of a palmate type and each leaf has seven to eleven leaflets, with serrated edges. The strong tap-root penetrates deep into the soil. However, if the soil conditions are unfavourable, the main root remains short, while lateral roots become more developed.

**SOILS:** Hemp can be grown on a wide variety of soil types. Hemp prefers a sufficiently deep, well-aerated soil with a pH of six or greater, along with good moisture and nutrient holding capacity. Poorly drained soils, however, are not recommended as excess surface water and heavy rains can result in damage to the hemp crop. Hemp is extremely sensitive to flooding and soil compaction.

**SOIL PREPARATION:** A fine, firm seedbed is required for fast, uniform germination of hemp seed. Conventional seedbed preparation and drilling are probably ideal. The seedlings will not emerge uniformly if the seed is placed at a depth greater than two inches. No-till systems can also be used with good results, but may be more vulnerable to erratic emergence depending on the growing season.

**NUTRITION:** To achieve an optimum hemp yield, twice as much nutrient must be available to the crop as will finally be removed from the soil at harvest. A hemp field produces a very large bulk of plant material in a short vegetative period. The nitrogen uptake is most intensive the first six to eight weeks, while potassium and in particular phosphorous are needed more during flowering and seed formation. Hemp requires 105 to 130 lbs/ac (120 to 150 kg/ha) nitrogen, 45 to 70 lbs/ac (50 to 80 kg/ha) phosphate and 52 to 70 lbs/ac (60 to 80 kg/ha) potash.

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**GROWING CONDITIONS:** Hemp prefers a mild climate, humid atmosphere, and a rainfall of at least 25-30 inches per year. Good soil moisture is required for seed germination and until the young plants are well established.

**WEED CONTROL:** Hemp is an extremely efficient weed suppresser. No chemicals are needed for growing this crop. A normal stand of 200 to 300 plants per square metre shades out the competition, leaving the fields weed-free at harvest for the next crop.

**TIME OF SEEDING:** The best time to seed hemp should be dictated by the weather and soil conditions, rather than the date on the calendar. Hemp can be seeded as early as two weeks prior to corn provided that soil conditions are optimum. However, seeding should not begin until soil temperatures have reached a minimum of 42-46 °F (6-8 °C), Hemp seed germinates within 24 to 48 hours, and emerges in 5-7 days with good moisture and warm temperature.

**PLANT POPULATION:** High yields of high quality fibre can be achieved with proper plant density. Seeding rates of 250-400 viable seeds per square metre are probably ideal, depending on soil type, soil fertility and cultivars. The seed or grain production will require lower seeding rates.

**CULTIVAR TYPES:** There are two types of hemp based on their use. These are fibre cultivars and seed cultivars which have shorter stalks, larger seed heads and may have numerous branches (seed contains 30-35% oil). Both types have low-THC content of less than 0.3%.

**ROTATION:** Hemp can be grown on the same land for several years in succession but rotation with other crops is desirable. Hemp responds well to soil from most preceding crops. It is also possible that introduction of hemp in a crop rotation might improve the soil health. An observation in 1996 showed that hemp may significantly reduce the population of soybean cyst nematodes.

**HARVEST:** Harvesting of hemp for high quality fibre occurs as soon as the last pollen is shed. Harvesting for seed occurs 4-6 weeks later, when 60% of the seed has ripened. Fibre hemp is normally ready to harvest in 70-90 days after seeding. The end use of the product may have a significant impact on the harvesting method. Traditional Hemp harvesting is carried out with agricultural mowers or Rape swathers. From here the crop is left whole on the ground and rowed up for baling once retted.

**RETTING:** The bast fibres are obtained by retting a microbial decay of pectin, the substance that glues the fibres to the woody core of hemp stem together. Retting is carried out in the field and depending on the weather it takes 12-18 days to be completed. During retting, the stems need to be turned one or two times in order to allow for even retting, since the stems close to the ground will remain green while the top ones are retted and turn brown. Retting is complete when the fibres turn golden colour and separate easily from wood in finer fibres.

**YIELD:** Based on yield data field expectations are between three to five tons of baled hemp stalks per acre on well-drained loamy soils.

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**STORAGE:** For storage, the moisture content of hemp stalks should not exceed 15%. The bales can be stored for a long time in dry places which could include storage sheds, barns or any other covered storage. In areas where no storage is available concrete bases have been put down and bales stored with tarpaulins tied over stacks.

### Harvesting Hemp:

The RtR Hemp Group held a session on the various methods of harvesting and processing hemp with local processing specialist, Ian Underhay:

There are many uses for the hemp plant and harvesting/processing will vary dependent on what our end product will be. To harvest and process hemp for building materials there are a few options-

**Traditional Long cut** - End Aug/Early Sept (after second cut of grass and before maize harvest) a modified rape swather is used to lay the hemp in swathes. It is then turned until browned and retted then baled in round bales. Ideal weather for this is dewy mornings and warm afternoons. Optimal for processing is 20% moisture in the baled product. The wetter the hemp is the harder it is to process at all. Whole round bales are then chopped to length with a large industrial guillotine (if harvesting for fibre the hemp would then be carded).

**Medium cut** - Using a modified forager harvester (the modification is two knives, slower turning and Ian's set of custom gears at a 1:4 ratio) that cut the hemp to length in field. It is then laid to swathes, retted, then into square heston bales and straight into processing machines. Faster retting time as has gone through rollers of forager. Ian created seven of these modified foragers, we would need to locate one and locate a machine that could use it- potentially a 20 year old forager.

For either option the swathed hemp can be turned with a regular hay turner.

**Fine cut-** Ian indicated that this may be the preferable route as we are not specifically harvesting for fibre. The whole hemp plant is cut very short in early Sept with a standard forager (with guide plates added to the kemper) and gathered in one operation. A large storage area would be required.

There are other hemp harvesting options to explore down the line if hemp growing is successful and there is an interest in harvesting for seeds as well. A Draper stripper headset then ordinary kemper header cutter underneath and then forage harvester afterward. However this double combine method is prohibitively expensive for the initial field trials.

### Concerns were raised over flammability if hemp is harvested as fine cut and stored 'in a pile'. Two potential solutions discussed:

- Bagging the crop into 25kg sacks. Machinery to do so is affordable. Crop can then be stored 70 bags to a pallet and once palletised is easy to transport. Up to 16 tons per day can be bagged. Plastic bags not ideal- need to look into/cost up biodegradable alternatives;
- Ensiling the crop until use would keep the temperature down but change the ph of the crop, would need to investigate if this would affect its use as construction material or the integrity of the finished hempcrete/cob. No minimum amount you can clamp but once opened and exposed to air the clamp would need to be used.



Harvest of hemp with the field chopper Claas Jaguar 850

(c)



Forage harvester Claas Jaguar 850,  
Header: CHAMPION 4500, Comp. Kemper.

(d)



Forage harvester JOHN DEERE 6810,  
Header: CHAMPION 4600, Comp. Kemper.

(e)



Forage harvester Claas Jaguar 850,  
Header: RU 450, Comp. Claas.

(f)



## SOWING

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### Early-Mid May Seeding

Known infestations of white mould and Scleractinia should be avoided.

Soil needs to be 8-10°C @ 1-1.5" (2.54-3.81cm) Depths, depth that seed should be sown at. Tight Row Spacing at 18cm is optimum for weed control.

Fertility management should be done pre-sowing.

Hemp has similar nutrient requirements as winter wheat.

Plant Density Target – 100 Plant/m<sup>2</sup> or 400'000/acre. Slow Start – Early June growth spurt, leading to waist to eye level plants by early July.

Low maintenance crop, under normal conditions it won't require weed or pest control.

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## HARVESTING

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Alterations required to normal combines, skid plates, guards and sleeves for rotating parts, belts rather than chains and augers to help direct crop flow and minimise wrapping.

Heads Cutter Bar – minimum 5"

Running combine below capacity helps separate large amounts of straw from flower/grain. Harvest from Start of August.

If hard frost, fibre dies and becomes a lot harder to harvest after 4 days following the frost. Harvest should be completed before risks of hard frosts

Harvest of fibre for bailing can be done with some diskbine cutters or swathers,

conditioning rolls set to minimum pressure and widest opening. Cutting or tillage will be easiest 4 days after grain harvest. Bailing can commence at 15%M.C.

Bale density lower than a hay bale.

Most balers can be used but tine pickers need to be in good working order with no missing teeth.

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## Processing Hemp:

RtR Hemp Group were circulated a scientific paper on “Wet Processing of Hemp: An Overview

By CHRISTINE IDLER, RALF PECENKA, CHRISTIAN FÜRL, and HANS-JÖRG GUSOVIOUS

Of the Leibniz-Institute for Agricultural Engineering Potsdam-Bornim, Potsdam, Germany

**ABSTRACT:** *Normally, the production of fibers from agricultural fiber crops is based on field drying and retting of plant straw. As weather conditions at the usual harvest time are often problematical for harvesting and retting, the development of weather-independent supply chain technologies is very important. The weather risk can be avoided, if, e.g., hemp after being harvested with a conventional forage harvester is directly processed to final products, or stored by wet preservation. Furthermore advantageous is that the whole plant material without any loss is processed to final products like fiber boards, insulation materials, or fibrous materials for natural fiber reinforced composites. Especially for this purpose a pilot plant has been built up and is tested till present. The investigations have shown that conventional technologies of ensiling are capable for the preservation of hemp for more than one year.*

## Markets for Hemp:

There appears to be limited available information regarding the UK Hemp market. The most up to date analysis appears to have been produced by Primer International for [“Grow Yorkshire Report”](#) (March 2021).

UK behind EU and US in Hemp growing - 35-40% production in UK produced in Yorkshire. Dominated by a few large producers (incl: East Yorks Hemp) and a growing number of smaller growers. Report underlines environmental benefits of Hemp growing; carbon sequestration, soil improvement and the versatility of the crop for a growing range of products.

## Use in Construction:

Hempcrete is made by mixing hemp shiv (the woody stem of the industrial hemp plant) together with a binder. The binder is usually either pure natural cement (a strongly hydraulic lime), or a formulated hempcrete binder made from lime mixed with a smaller proportion of pozzolans, natural additives or Portland cement.

Hempcrete can be wet-mixed on site and cast around a structural frame, or pre-cast off site to form blocks or panels. Although very hard and self-supporting once set, hempcrete is not

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load bearing. This is due to the amount of air trapped within the material and the slightly flexible nature of the hemp shiv aggregate.

Hempcrete has a medium density, which means it provides both insulation and thermal mass within the same material. It is vapour-permeable, meaning that water vapour is allowed to pass freely through the wall assembly, rather than being trapped within it, which can cause damp and deterioration to the building's fabric.

In new-build, hempcrete is most often used to make walls, but it can also be used to form insulating floor slabs, ceilings, and roof insulation. In contrast to conventional insulation materials (which tend to be installed in a cavity within the wall, or added to the wall as an extra layer in the build-up), hempcrete forms the wall and insulation in one solid piece of material; the only other integral material being the structural frame (usually untreated softwood).

Wet finishes - a lime or clay plaster internally and lime render externally - are applied directly to the surface of the hempcrete wall, and these are the only other materials that need to be added to the basic hempcrete wall, although cladding (timber, stone, brick etc.) can be used in place of wet finishes, if desired.

Hempcrete is a vapour-permeable material which is hygroscopic; it absorbs moisture from the air when humidity is high (releasing it again when humidity levels drop). These properties are very important, both for the health of the building's occupants and in order to keep the fabric of the building in good condition.

In traditionally constructed (pre-1919) buildings, hempcrete works in harmony with the original materials, allowing the building to "breathe"; meaning that water vapour can pass in and out of the wall rather than being retained within it to cause damp, mould, and eventually damage to the building's fabric. Hempcrete is made entirely from natural materials and is naturally fire-, rot- and pest-resistant, which means there is no need for potentially toxic chemical treatment of the material. This fact, together with their hygroscopicity, means that hempcrete buildings are extremely healthy living environments.

Hempcrete is a sustainable material. The hemp plant used as the aggregate in hempcrete absorbs so much carbon during its rapid growth that, even after the energy used in production of the lime binder, transportation and during construction is allowed for, more CO<sub>2</sub> is locked up in a hempcrete wall than is used to build it. In other words, hempcrete has negative net carbon emissions; it's a "better-than-zero- carbon" material. The exceptional eco-credentials of this natural, sustainable material make hempcrete the obvious choice if you want to reduce your energy bills, your carbon footprint and the overall impact of your building on the environment. See: [WWW.UKHEMPCRETE.COM](http://WWW.UKHEMPCRETE.COM)

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## Preparing a Phase 2 bid

Throughout the RtR Hemp Group sessions WCA have been working to develop a Phase 2 proposal to the Dorset AONB Farming in Protected Landscapes grant fund. This has involved discussions and site visits to the participating farms, research about hemp harvesting & processing and investigation of the baselining and survey needs that would capture and quantify the benefits for soil health and biodiversity from hemp growing.

WCA has joined the Innovative Farmers field lab exploring the benefits of hemp for soil health and biodiversity. It has been agreed to align surveys from the West Dorset field trials with the UK wide assessment being led by Cranfield University:

### The following measurements are proposed to be taken on site by Dorset Wildlife Trust:

#### **SOIL** (change over time, before planting and after harvest)

- Soil organic carbon (SOC) - using NRM's Soil Carbon Check service, sampling kits will be sent to the growers. They will collect 5 random samples at 0.3 metres deep across the representative area following a standard W pattern of sampling and send these off to NRM labs for analysis
- Soil structure - using the visual soil assessment (VSA) which includes a range of soil properties (soil texture, soil structure), three random sampling points will be chosen within the representative area (coinciding with the SOC sampling points). Infiltration will be assessed using the single ring falling head method, to understand the main drainage and aeration channels through the soil. Three infiltration measurements will be taken at three of the VSA sampling points.
- Soil biology - earthworm counts, including midden counts as a surrogate to indicate anecic earthworm activity. The group will follow AHDB's GreatSoils 'How to count earthworms' guide. All middens within a 1 metre radius of the VSA sample point will be collected.

#### **NUTRIENTS**

- Crop biomass - assessments of post-harvest biomass remaining in the field to understand nutrients available for next crop. This will be collected at the same sampling points as the SOC assessments and sent off to a laboratory for N,P and K assessments. NB: Laboratories require a license to handle hemp.

#### **BIODIVERSITY**

- Above-ground biodiversity abundance - a simple walk through fields, counting and categorising insects, particularly pollinators or predatory insects, including larval/pupal stages.
  - Below-ground biodiversity = soil biology as above
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## 5. CONCLUSIONS

**The RtR Hemp Group has successfully engaged local farmers, landowners and contractors in exploring the opportunities presented by Hemp in supporting a shift to regenerative agriculture and a more localised and distributive economy.**

As a result of the Phase 1 FiPL funding the Hemp Group has developed and submitted a Phase 2 Funding bid to FiPL to support 4 on farm field trials in growing, harvesting and processing hemp in Spring/Summer 2022.

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## Appendix - Experience of a 2 Ha field trial in hemp growing by a Wiltshire Farmer

Agrees with the imperative that we must start building with a growing % natural materials if stand any chance of meeting carbon reduction targets
Hemp is an amazing crop offering benefits all round; carbon sequestration, multiple uses replacing fossil fuel derived products ( carbon fibre), deals well with moisture, doesn't rot, anti bacterial etc etc
As well as a the 2 HA field trial also involved in Cornwall with Hemp growing for medical uses
Done some work with Plymouth University people on structural strength of Hemp Lintels? Important to get building regs approval for Structural hemp construction.
Experimenting with compressed shiv into fibre board
<b>Warning regarding the licence application process</b> – some strange questions testing applicant understanding of regulations.
<b>Need to line up, even pre order, hemp seed. Can't purchase without licence and his licence only came through end of March</b> , too late for Seed people. Ended up scrapping together seed for a June planting.
Pick seed variety well – some varieties favour seed, shiv, fibre yields. He went for Bazooka, good for fibre and shiv
Field trial was 2 Ha bought 200kg seed, direct drilling at different seed rates. Denser sowing areas produced dense plants that were easier to harvest
Experienced differential germination, some areas didn't take but saw secondary germination. Ave height crop 2m, some areas 3.5 m area of secondary germination 700mm.
Despite late sowing left the crop till October for harvesting, standing crop had begun to rot, didn't want to rot in the field due fear not being able to lift it in wet conditions of autumn.
Used a kemper headed forage harvester with blades taken out, paddles left A tough crop to harvest, contractor was use to maize harvesting allocated whole day for 2 Ha, dense areas cut more easily, but still got snagged/ wrapped
Found that combination of standing retting +forage harvester chopping had started processing fibre from shiv. Has bailed and silage wrapped crop for storage.
Come across number of farmers ensilaging hemp – Essex guy contractor also using dryers
Economically thinks you need to use 2 of the 3 main hemp products – fibre, seed and shiv. Is looking to invest in processing plant - £2m will need to deal with 2/3 tonnes an hour to justify...

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## Hemp References:

<https://eastyorkshirehemp.co.uk/products/building-products/>

<https://fibershed.org/2020/08/07/growing-50-acres-of-hemp-in-north-carolina-field-notes-from-the-one-acre-exchange/>

<https://britishhempalliance.co.uk/about-hemp/>

<https://www.theconstructionindex.co.uk/news/view/hemp-to-the-rescue>

<https://www.savills.co.uk/landing-pages/landscape/HempSpotlight.pdf>

<https://www.margentsfarm.com/>

<https://practicearchitecture.co.uk/project/flat-house/>

<https://dunagrohempgroup.com/>

<https://www.theconstructionindex.co.uk/news/view/hemp-to-the-rescue>

<https://www.canvas.me/Articles/Science-and-Tech/Chernobyl-and-the-power-of-the-hemp-plant>

<https://www.fwi.co.uk/arable/crop-selection/market-opportunities/why-hemp-is-an-attractive-alternative-crop-to-osr>

HCM - <https://youtu.be/gTVshCIm5j4>

Hemp Expo – Panel Discussion - <https://youtu.be/asu-fkDEEWU>

### News

BBC - <https://youtu.be/MugvOocsyYE>

ITV - <https://youtu.be/rQQXE1q-h18>

### Presentations/Decks

Global Solutions - [https://1drv.ms/b/s!ArSMi-Ffu9D6g\\_B9WeKkw35xrJkqow?e=1zj9yg](https://1drv.ms/b/s!ArSMi-Ffu9D6g_B9WeKkw35xrJkqow?e=1zj9yg)

HBR – The Solution - <https://1drv.ms/b/s!ArSMi-Ffu9D6g-VtF5ualFmG-xVl2g?e=HRVKSX>

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