



InCrops Project

The InCrops Enterprise Hub is a regional knowledge transfer project that has been designed specifically to establish a distributed enterprise hub in alternative and non-food crops and to promote innovation and high value business opportunities for those seeking to exploit, through advanced technologies, the derivatives of such crops across a wide range of sectors and industries.

Our expert team of staff work to bridge the gap between R&D, business and regional economic growth. This document shows how InCrops thinks globally and invests locally to build advanced clusters for business exploitation. This activity address priority development areas in the alternative and non food crop sectors and utilises the East of England's world class research base in plant and crop science.

The information below maps global markets to regional economic opportunities and identifies which InCrops staff members are leading work in each sector. If you are interested in discussing any of these areas with InCrops please contact us (full details within).



LS - Dr Liliya Serazetdinova – Business Innovation Manager InCrops/JIC
BSR - Dr Beatrix Schlarb-Ridley – Business Innovation Manager InCrops/University of Cambridge
MC - Dr Mark Coleman – Business Innovation Manager InCrops/IFR
BB – Benedict Binns – Business Innovation Manager InCrops/BRE
BF – Bianca Forte, Business Innovation Manager InCrops/Rothamsted Research
CGE - Dr Carlos Gonzalez-Esquivel – Agri-Business Manager InCrops/Easton College
BT – Dr Bruce Tofield – Consultant
SF – Dr Sally Francis - Consultant

l.serazetdinova@uea.ac.uk 0777 630 1718
b.schlarb-ridley@uea.ac.uk 0777 898 3612
m.coleman@uea.ac.uk 07977 263640
b.binns@uea.ac.uk 07947 157707
b.forte@uea.ac.uk 07776 471810
c.gonzalez-esquivel@uea.ac.uk 0777 645 4204
b.tofield@uea.ac.uk

**Areas in green denote exploitation platforms with associated strategy development*

Global Market Highlights	Regional Economic Opportunities and end uses for East of England	InCrops team lead	InCrops team interest
<ul style="list-style-type: none"> • Biopolymers <ul style="list-style-type: none"> ○ Global market \$80bn ○ Principally food uses ○ Biopolymer market share 1.5%-2%, potentially 10% ○ Petrochemical substitution • Biolubricants, solvents and platform chemicals <ul style="list-style-type: none"> ○ consume 14% global vegetable oil production ○ 30% surfactants plant-derived ○ Biolubricants market share expected to rise from 2% ○ Plant-based solvents 1.5%-2% market share due to opposition to VOCs 	<ul style="list-style-type: none"> • Plastic packaging <ul style="list-style-type: none"> ○ technology transfer required to exploit market potential ○ significant fresh food packaging sector in EE ○ proportional of world share can come to EE linked to innovation in bioplastics especially polysaccharide technology ○ requires LCA and enhanced production and disposal • Oleochemicals <ul style="list-style-type: none"> ○ specialist oil crops capable of growing in E of E ○ scope to develop new biolubricants ○ proportion of world share can come to E of E linked to biorefining expansion ○ scope for plant oil based biopolymers ○ linked to functional food uses of oils 	LS	BSR
<ul style="list-style-type: none"> • Biocomposites • Natural fibres in automotive, marine and aeronautical sectors <ul style="list-style-type: none"> ○ EU automotive demand potential 100kt by 2010 ○ Current 7-8kg per vehicle, potentially 12-13k 	<ul style="list-style-type: none"> • Natural fibres as alternatives to glass fibre in composites <ul style="list-style-type: none"> ○ scope for hemp, flax and 'other' fibres into composite panels, body internal panels and reinforced fibreglass. Scope to stimulate demand through best practice in the region. ○ scope to increase above 12-13kg with technological innovation ○ Scope with marine and boat building sector ○ Fibre modification 	MC	LS

Global Market Highlights	Regional Economic Opportunities and end uses for East of England	InCrops team lead	InCrops team interest
<ul style="list-style-type: none"> • Green built environment <ul style="list-style-type: none"> ○ Hemp into building ○ New fibres into insulation, miscanthus, flax etc ○ Finished wood products into housing ○ Shopfitting & other commercial applications ○ Civil engineering applications ○ Plants as service providers (ecosystem services) 	<ul style="list-style-type: none"> • Natural products into construction <ul style="list-style-type: none"> ○ market demand for hemp and other innovative housing products ○ low carbon functionality as well as low carbon through sequestration ○ E of E housing growth projecting 500,000 new homes ○ technology transfer to enhance U value performance ○ need to substitute finished wood imports ○ eco fit out, retrofit 	BB	BT
<ul style="list-style-type: none"> • LCA, Life cycle analysis and carbon footprinting 	<ul style="list-style-type: none"> • Platform for SME services, initially green build but expanding to other sectors 	BB	BT
<ul style="list-style-type: none"> • Functional foods and health products <ul style="list-style-type: none"> ○ Global market value over 120 billion ○ Rapidly growing international consumer market ○ Health foods/ diabetes management/high soluble fibre ○ Essential oils ○ Natural products into skin creams ○ Cosmaceuticals 	<ul style="list-style-type: none"> • Functional Foods <ul style="list-style-type: none"> ○ scope for local production of functional food crops eg naked barley, camellina, slow foods and extracts ○ scope for local high value added supply chains ○ scope to increase essential oil production ○ scope for berry crops with multiple end uses ○ scope for local producers 	MC	BF, BSR
<ul style="list-style-type: none"> • Bioenergy and Biofuels • Transport <ul style="list-style-type: none"> ○ Petrol fuels represent 50-60% of global oil demand ○ EU target of 10% renewable fuels in transport by 2020 ○ Minimum greenhouse gas savings required by EC ○ Biofuels demand worldwide may double in 10 years • Heat and Power <ul style="list-style-type: none"> ○ EU biomass supply from crops was 3% in 2003 ○ Cost competitiveness vs oil and gas is crucial ○ Weak demand pull means government incentives ○ Energy from waste in gaining increased interest 	<ul style="list-style-type: none"> • Feedstocks <ul style="list-style-type: none"> ○ Forestry waste resources are not fully utilised ○ Under-utilised biomass crops due to poor supply chains ○ World class expertise in plant sciences and crop development • Conversion Processes <ul style="list-style-type: none"> ○ Scope to advance technology to allow conversion of lignocellulosic biomass and waste into bioethanol ○ Scope to prototype new fuels through high-tech industries – biotech cluster, advanced manufacturing and OEMs ○ First-class expertise in anaerobic digestion ○ Cutting-edge research on biochar produced via gasification 	BF	BSR, MC

Global Market Highlights	Regional Economic Opportunities and end uses for East of England	InCrops team lead	InCrops team interest
<ul style="list-style-type: none"> • Biorefineries, Biopharma and biopharmaceuticals • Natural pharma and natural remedies • Plant based Nanotechnology • Algal technologies ○ \$50bn biopharmaceuticals market 2003 ○ Cost and scalability advantages of bioreactors vs conventional production ○ Substantial potential for production of complex chemicals in plants ○ Barrier of public acceptability in EU 	<ul style="list-style-type: none"> • Exploitation of products from Biorefining, IBTI • Industrial biotechnology • Expand nanotech • Biopharming <ul style="list-style-type: none"> ○ eg algae based suncreams – future alternative C capture and metabolite production ○ biotech industry slow to exploit -scope to accelerate ○ steer towards closed controlled systems and culture systems linked to CHP heat and CO2. ○ Algal and micro plant innovation ○ Inward investment from Chinese and Indian companies 	BSR	LS MC
<ul style="list-style-type: none"> • New consumer markets ○ Emerging markets in household goods, ecopaints, furnishings, ○ Fashion and clothing and natural pigments 	<ul style="list-style-type: none"> • New green consumer markets <ul style="list-style-type: none"> ○ isolated examples in E of E with scope for support for expansion and new business start ups with local supply chains ○ examples of high value fashion based markets in South East and Europe that can be supplied from E of E. 	LS	BB
<ul style="list-style-type: none"> • Agronomy and crop improvement 	<ul style="list-style-type: none"> • Germplasm seed banks for lesser known crops • Crop husbandry and improvement • Plant breeding, seed supply • New crop opportunities and climate adaptation • Agri-business opportunities • Agri business supply chains • Crop protection, natural biocides 	CGE	MC LS SF