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Energy And Fibre
Miscanthus

***For Energy
And Fibre***

Ethanol as an
alternative
fuel is
receiving a
lot of
attention
because it

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addresses
concerns
related to
dwindling oil
supplies,
energy
independence,
and climate
change. The
majority of
the ethanol in
the US is

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produced from
corn starch.
With the US
Department of
Energy's
target that
30% of the
fuel in the US
is produced
from renewable
resources by
2030, the

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anticipated demand for corn starch will quickly exceed the current production of corn. This, plus the concern that less grain will become

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available for food and feed purposes, necessitates the use of other feedstocks for the production of ethanol. For the very same reasons, there is

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increasing
research
activity and
growing
interest in
many other
biomass crops.
Genetic
Improvement of
Bio-Energy
Crops focuses
on the

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production of ethanol from lignocellulosic biomass, which includes corn stover, biomass from dedicated annual and perennial energy crops, and trees as

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well as a number of important biomass crops. The biomass is typically pretreated through thermochemical processing to make it more amenable to

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hydrolysis
with
cellulolytic
enzymes. The
enzymatic
hydrolysis
yields
monomeric
sugars that
can be
fermented to
ethanol by mic

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ro-organisms.

While much emphasis has been placed on the optimization of thermo-chemical pretreatment processes, production of more efficient

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hydrolytic
enzymes, and
the
development of
robust
microbial
strains,
relatively
little effort
has been
dedicated to
the

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improvement of
the biomass
itself.

As the human
population
expands and
natural
resources
become
depleted, it
becomes
necessary to

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explore other
sources for
energy
consumption
and usage.

Renewable and
Alternative
Energy:
Concepts,
Methodologies,
Tools, and
Applications

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provides a comprehensive overview of emerging perspectives and innovations for alternative energy sources.

Highlighting

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relevant
concepts on
energy
efficiency,
current
technologies,
and ongoing
industry
trends, this
is an ideal
reference
source for

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academics,
practitioners,
professionals,
and upper-
level students
interested in
the latest
research on
renewable
energy.

The 1st World
Conference and

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Technology
Exhibition on
Biomass for
Energy and
Industry, held
in Sevilla in
June 2000,
brought
together for
the first time
the
traditional

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European
Conference on
Biomass for
Energy and
Industry and
the Biomass
Conference of
the Americas,
thus creating
the largest
and most
outstanding

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event in the worldwide biomass sector. The conference elaborated innovative global strategies, projects and efficient practice rules

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for energy and the environment at a key stage in the industry's development. New concepts and projects were highlighted to increase the social and

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political
awareness for
a change in
worldwide
resource
consumption
and to promote
economically,
socially and e
nvironmentally
sustainable
development

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for the next millennium. In 2 volumes, the Proceedings include some 470 papers essential to an understanding of current thinking, practice,

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research and
global
developments
in the biomass
sector - a
vital
reference
source for
researchers,
manufacturers,
and policy
makers

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involved or
interested in
the use of
biomass for
energy and
industry.
This book
discusses
various
renewable
energy
resources and

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Topics covered include recent advances in photobioreactor design; microalgal biomass harvesting, drying, and processing; and

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technological advances and optimised production systems as prerequisites for achieving a positive energy balance. It highlights alternative

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resources that
can be used to
replace fossil
fuels, such as
algal
biofuels,
biodiesel,
bioethanol,
and
biohydrogen.
Further, it
reviews

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microbial
technologies,
discusses an
immobilization
method, and
highlights the
efficiency of
enzymes as a
key factor in
biofuel
production. In
closing, the

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book outlines
future
research
directions to
increase oil
yields in
microalgae,
which could
create new
opportunities
for lipid-
based

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biofuels, and provides an outlook on the future of global biofuel production. Given its scope, the book will appeal to all researchers and engineers

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working in the
renewable
energy sector.

Bioenergy
Research:
Advances and
Applications
brings biology
and
engineering
together to
address the

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challenges of
future energy
needs. The
book
consolidates
the most
recent
research on
current
technologies,
concepts, and
commercial

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developments
in various
types of
widely used
biofuels and
integrated
biorefineries,
across the
disciplines of
biochemistry,
biotechnology,
phytology, and

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All the chapters in the book are derived from international scientific experts in their respective research areas. They

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provide you
with clear and
concise
information on
both standard
and more
recent
bioenergy
production
methods,
including
hydrolysis and

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microbial
fermentation.
Chapters are
also designed
to facilitate
early stage
researchers,
and enables
you to easily
grasp the
concepts,
methodologies

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and

application of
bioenergy
technologies.
Each chapter
in the book
describes the
merits and
drawbacks of
each
technology as
well as its

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The book provides information on recent approaches to graduates, post-graduates, researchers and practitioners studying and

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working in
field of the
bioenergy. It
is an
invaluable
information
resource on
biomass-based
biofuels for
fundamental
and applied
research,

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catering to
researchers in
the areas of
bio-hydrogen,
bioethanol,
bio-methane
and
biorefineries,
and the use of
microbial
processes in
the conversion

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of biomass
into biofuels.
Reviews all
existing and
promising
technologies
for production
of advanced
biofuels in
addition to
bioenergy
policies and

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research
funding
Cutting-edge
research
concepts for
biofuels
production
using
biological and
biochemical
routes,
including

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microbial fuel
cells Includes
production
methods and
conversion
processes for
all types of
biofuels,
including
bioethanol and
biohydrogen,
and outlines

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the pros and
cons of each
Technological
Innovation for
Cyber-Physical
Systems

Phytoremediati
on Potential
of Perennial
Grasses

Perennial
Grasses for

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Bioenergy and
Bioproducts
Energy Crops
With Recent
Theory and
Applications
The Role of
Catalysis for
the
Sustainable
Production of
Bio-fuels and

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Bio-chemicals

This book constitutes
the refereed
proceedings of the
7th IFIP WG
5.5/SOCOLNET
Advanced Doctoral
Conference on
Computing, Electrical
and Industrial
Systems, DoCEIS
2016, held in Costa
de Caparica,
Portugal, in April

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2016. The 53 revised full papers were carefully reviewed and selected from 112 submissions. The papers present selected results produced in engineering doctoral programs and focus on research, development, and application of cyber-physical systems.

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Research results and ongoing work are presented, illustrated and discussed in the following areas:

enterprise
collaborative
networks; ontologies;
Petri nets;
manufacturing
systems; biomedical
applications;
intelligent
environments;

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control and fault tolerance; optimization and decision support; wireless technologies; energy: smart grids, renewables, management, and optimization; bio-energy; and electronics.

This book is a comprehensive

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reference for energy crops from the plant perspective with expert authors for each crop. Of particular importance are the chapters covering the sustainability aspects (social, economic and environmental), including food security.

Edited by Jean-

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Claude Kader and Michel Delseny and supported by an international Editorial Board, *Advances in Botanical Research* publishes in-depth and up-to-date reviews on a wide range of topics in plant sciences. Currently in its 50th volume, the series features a wide range

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together a small selection of full-length papers based on presentations given at the 27th European Biomass Conference and Exhibition held in Lisbon, Portugal in 2019. The topics covered, which reflect the breadth of the program of the EUBCE conference

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itself, include biomass sources, various aspects of technologies used for the conversion of biomass to bioproducts and bioenergy, as well as different approaches to assessing environmental impacts, which include case studies based on different

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technologies in use in a range of countries. The volume on Industrial Crop Breeding will be part of the series, Handbook of Plant Breeding. This volume will focus on the emerging area of plant breeding for sustainable production of transportation fuels

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and bio based products using the current advances in the field. The book is scheduled to consist of a total number of 30 chapters divided into four sections. The sections will emphasize crops being considered for different challenge areas including oil crops for biodiesel;

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sugar, starch and cellulosic crops for biofuel; crops for bio products and issues and future prospects. A chapter introducing the first three sections will also be included.

Outstanding scientists for each crop species are proposed as senior authors, who may

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invite co-authors to contribute part of a chapter to provide additional expertise or perspective. The proposed authors will represent various national and international institutions to get a more diverse view on the topic and somehow get a global view on the

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common issues that researchers on industrial crops are facing. The book will comprise primarily of specific issues, available germplasm, breeding techniques, and potential geographical areas of production pertaining to individual crops being considered for industrial uses. We

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hope to encourage the proposed authors of new crops to provide an estimate of the crop readiness for commercial development and discuss the limitations. This book will be of interest and envisioned to serve as an updated reference to

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researchers in both academic and industrial setting, to students and teachers of plant breeding and to policy makers who are looking for alternative solutions to dependency on imported petroleum products.

Kenaf: A Multi-Purpose Crop for

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Several Industrial
Applications
Ecological,
Agronomic and Policy
Perspectives on
Minimizing Risk
Genetic Improvement
of Bioenergy Crops
Potential Economic
and Environmental
Effects of U.S. Biofuel
Policy

7th IFIP WG

5.5/SOCOLNET

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Advanced Doctoral
Conference on
Computing, Electrical
and Industrial
Systems, DoCEIS
2016, Costa de
Caparica, Portugal,
April 11-13, 2016,
Proceedings
Polymer Composites
and the Environment
***This book explains
the concept of using***

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*phytotechnology with
biomass production to
improve soil quality
and restore
contaminated sites to
a useful state that has
economic and social
value.*

*Phytotechnology with
Biomass Production:
Sustainable
Management of
Contaminated Sites*

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focuses on the application of second-generation biofuel crops, primarily Miscanthus, to slightly contaminated or marginal postmilitary and postmining soils. Based on recent and ongoing research from the United States, Ukraine, the

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Czech Republic, and Germany, along with case studies from other countries, this is the first comprehensive book on using phytotechnology with biomass production at contaminated sites at a global level.

FEATURES *Focuses on an important topic*

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*of a growing global
activity: soil
improvement through
biomass production
Includes case studies
and success stories
from different
countries on
application of
Miscanthus
phytotechnology to
sites differently
contaminated by trace*

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*elements, pesticides,
and petroleum
products Discusses
the peculiarities of
Miscanthus
production on
postmilitary and
postmining
contaminated lands
and the impact of
plant growth
regulators, soil
amendments,*

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*fertilizers, and
biochar to the process
Introduces soil fauna
as indicators of soil
health during
Miscanthus
phytotechnology
application Presents
Miscanthus value
chain associated with
the processing of
Miscanthus biomass
to different*

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bioproducts While
written primarily for
faculty, students,
research scientists,
environmental and
agricultural
professionals,
gardeners, farmers,
landowners, and
government officials,
this book has value
for all who are
working on

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*phytotechnology
projects and
phytomining to
reduce risk and/or
improve soil quality at
contaminated sites.*

*Phytotechnology with
Biomass Production:
Sustainable
Management of
Contaminated Sites is
also a great new
resource for those*

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*who are new to the
topic and want to
learn to apply
phytotechnologies
and biomass
production with
further conversion
into energy and
bioproducts.*

*A whole host of
motivations are
driving the
development of the*

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“renewables”

industry— ranging from the desire to develop sustainable energy resources to the reduction of dangerous greenhouse gases that contribute to global warming. All energy utilized on the earth is ultimately derived from the sun through

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photosynthesis—the only truly renewable commodity. As concerns regarding increasing energy prices, global warming and renewable resources continue to grow, so has scientific discovery into agricultural biomass conversion. Plant

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Biomass Conversion addresses both the development of plant biomass and conversion technology, in addition to issues surrounding biomass conversion, such as the affect on water resources and soil sustainability. This book also offers a

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brief overview of the current status of the industry and examples of production plants being used in current biomass conversion efforts.

Concerns about energy security, uncertainty about oil prices, declining oil reserves, and global

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climate change are fueling a shift towards bioenergy as a renewable alternative to fossil fuels. Public policies and private investments around the globe are aiming to increase local capacity to produce biofuels. A key constraint to the

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expansion of biofuel production is the limited amount of land available to meet the needs for fuel, feed, and food in the coming decades.

Large-scale biofuel production raises concerns about food versus fuel tradeoffs, about demands for natural resources

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such as water, and about potential impacts on environmental quality. The book is organized into five parts. The introductory part provides a context for the emerging economic and policy challenges related to bioenergy and the

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*motivations for
biofuels as an energy
source. The second
part of the handbook
includes chapters that
examine the
implications of
expanded production
of first generation
biofuels for the
allocation of land
between food and fuel
and for food/feed*

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*prices and trade in
biofuels as well as the
potential for
technology
improvements to
mitigate the food vs.
fuel competition for
land. Chapters in the
third part examine
the infrastructural
and logistical
challenges posed by
large scale biofuel*

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production and the factors that will influence the location of biorefineries and the mix of feedstocks they use. The fourth part includes chapters that examine the environmental implications of biofuels, their implications for the design of policies and

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*the unintended
environmental
consequences of
existing biofuel
policies. The final
part presents
economic analysis of
the market, social
welfare, and
distributional effects
of biofuel policies.
With increased public
and scientific*

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attention driven by factors such as oil price spikes, the need for increased energy security, and concerns over greenhouse gas emissions from fossil fuels, the production of fuels by biological systems is becoming increasingly important as the

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world seeks to move towards renewable, sustainable energy sources. Biofuels and Bioenergy presents a broad, wide-ranging and informative treatment of biofuels. The book covers historical, economic, industrial, sociological and ecological/environmental

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perspectives as well as dealing with all the major scientific issues associated with this important topic. With contributions from a range of leading experts covering key aspects, including:

- *Conventional biofuels.*
- *Basic biology, biochemistry and chemistry of*

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*different types and
classes of biofuel. •*

*Current research in
synthetic biology and
GM in the*

*development and
exploitation of new
biofuel sources. •*

*Aspects relating to
ecology and land use,
including the fuel v
food dilemma. •*

Sustainability of

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*different types of
biofuel. • Ethical
aspects of biofuel
production. Biofuels
and Bioenergy
provides students and
researchers in
biology, chemistry,
biochemistry and
chemical engineering
with an accessible
review of this
increasingly*

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important subject.

*Providing
comprehensive
coverage on biofuel
crop production and
the technological,
environmental and
resource issues
associated with a
sustainable biofuel
industry, this book is
ideal for researchers
and industry*

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personnel. Beginning with an introduction to biofuels and the challenges they face, the book then includes detailed coverage on crops of current importance or with high future prospects, including sections on algae, sugar crops and grass, oil and forestry

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species. The chapters focus on the genetics, breeding, cultivation, harvesting and handling of each crop.

*Concepts,
Methodologies, Tools,
and Applications*

Biofuel Crop

Sustainability

Handbook of

Bioenergy Economics

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and Policy

Plant Biomass

Conversion

Biomass and Biofuels

Computational

Intelligence Systems

in Industrial

Engineering

The Saccharinae

clade of the

Poaceae (grass)

family of flowering

plants includes

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several important crops with a rich history of contributions to humanity and the promise of still-greater contributions, as a result of some of the highest biomass productivity levels known, resilience to drought and other

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environmental challenges that are likely to increase, amenability to production systems that may mitigate or even reverse losses of ecological capital such as topsoil erosion, and the recent blossoming of sorghum as a botanical and

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genomic model for the clade. In Genomics of the Saccharinae, advances of the past decade and earlier are summarized and synthesized to elucidate the current state of knowledge of the structure, function, and

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evolution of the
Sorghum,
Saccharum, and
Miscanthus genera,
and progress in the
application of this
knowledge to crop
improvement. As a
backdrop, it is
important to
understand the
naturally occurring
diversity in each

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genus, its organization and distribution, and its evolutionary history. Genomic tools and methods for Saccharinae biology and improvement have improved dramatically in the past few years – a detailed summary of these tools and their

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applications is a central element of this book.

Application of genomic tools to priorities in crop improvement, including understanding and manipulating plant growth and development, composition, and

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defense, as well as increasing the quality and productivity of seed/grain, sugar, biomass, and other value-added products under a range of conditions and inputs, are addressed. In particular, as the first native African

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crop to emerge as a genomic model, sorghum offers an excellent case study of challenges and opportunities in linking new advances in biosciences to solving some of Africa's major agricultural problems. Several

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members of the
clade, exemplified
by Sorghum
halepense
(Johnsongrass)
offer insights into
weediness and
invasion biology.
The first sequence
for a member of the
clade, sorghum, as
well as progress
and challenges

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toward sequencing of additional members and the new opportunities that this will create, are also explored. Indeed, the very complexities that have hindered study of some clade members also offer intriguing opportunities to gain

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insight into
fundamental
questions such as
roles of polyploidy in
agricultural
productivity and
post-polyploidy
evolution.

Miscanthus is a
promising non-food
crop yielding high
quality
lignocellulosic

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material which can be used in a number of ways, including energy and fibre production, thatching, and industrial use. This book encompasses the results and recommendations arising from extensive trials and experiments carried

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out by the leading European research organisations and institutions in the field. Much of the research was performed under the auspices of the Miscanthus Productivity Network, established under European Union's

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Directorate General
for Agriculture (DG
VI). This book
presents expert
guidance to growth
conditions and
breeding of
Miscanthus,
potential productivity
and economics,
environmental
aspects, and
harvesting, storage

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and utilisation. A guide to this increasingly important subject is long overdue and will be welcomed by all those involved in biomass production and renewable energies, or assessing the potential of Miscanthus as a

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non-food crop.

As the climate and environment continue to fluctuate, researchers are urgently looking for new ways to preserve our limited resources and prevent further environmental degradation. The

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answer can be found through computer science, a field that is evolving at precisely the time it is needed most.

Soft Computing Applications for Renewable Energy and Energy Efficiency brings together the latest technological

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research in
computational
intelligence and
fuzzy logic as a way
to care for our
environment. This
reference work
highlights current
advances and future
trends in
environmental
sustainability using
the principles of soft

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computing, making it an essential resource for students, researchers, engineers, and practitioners in the fields of project engineering and energy science. This book presents a flavour of activities focussed on the

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need for sustainably produced biomass to support European strategic objectives for the developing bioeconomy. The chapters cover five broad topic areas relating to the use of perennial biomass crops in Europe.

These are:

‘Bioenergy

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Resources from
Perennial Crops in
Europe', 'European
Regional Examples
for the Use of
Perennial Crops for
Bioenergy',
'Genotypic Selection
of Perennial
Biomass Crops for
Crop Improvement',
'Ecophysiology of
Perennial Biomass

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Crops' and
'Examples of End-
Use of Perennial
Biomass Crops'.
Two major issues
relating to the future
use of biomass
energy are the
identification of the
most suitable
second generation
biomass crops and
the need to utilise

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land not under intensive agricultural production, broadly referred to as 'marginal land'. The two main categories of plants that fit these needs are perennial rhizomatous grasses and trees that can be coppiced. The

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overarching
questions that are
addressed in the
book relate to the
suitability of
perennial crops for
providing feedstocks
for a European
bioeconomy and the
need to exploit
environments for
biomass crops
which do not

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compete with food crops. Bioenergy is the subject of a wide range of national and European policy measures. New developments covered are, for example, the use of perennial grasses to produce protein for animal feed and concepts to use

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perennial biomass
crops to mitigate
carbon emissions
through soil carbon
sequestration.

Several chapters
also show how
prudent selection of
suitable genotypes
and breeding are
essential to develop
high yielding and
sustainable second

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generation biomass crops which are adapted to a wide range of unfavourable conditions like chilling and freezing, drought, flooding and salinity. The final chapters also emphasise the need to be kept an eye out for potential new

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end-uses of perennial biomass crops that will contribute further to the developing bioeconomy.

Wild crop relatives are now playing a significant part in the elucidation and improvement of the genomes of their cultivated

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counterparts. This work includes comprehensive examinations of the status, origin, distribution, morphology, cytology, genetic diversity and available genetic and genomic resources of numerous wild crop

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relatives, as well as of their evolution and phylogenetic relationship. Further topics include their role as model plants, genetic erosion and conservation efforts, and their domestication for the purposes of bioenergy,

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phytomedicines,
nutraceuticals and
phytoremediation.

Wild Crop Relatives:
Genomic and
Breeding Resources
comprises 10
volumes on Cereals,
Millets and Grasses,
Oilseeds, Legume
Crops and Forages,
Vegetables,
Temperate Fruits,

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Tropical and
Subtropical Fruits,
Industrial Crops,
Plantation and
Ornamental Crops,
and Forest Trees. It
contains 125
chapters written by
nearly 400 well-
known authors from
about 40 countries.
Production,
Physiology and

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Genetics

Green Composites

Phytotechnology

with Biomass

Production

1st World

Conference on

Biomass for Energy

and Industry

Industrial Crops

Surface Properties

of Non-conventional

Cellulose Fibres

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*Biomass to
Renewable Energy
Processes,
Second Edition,
explains the
theories of
biological
processes,
biomass
materials and
logistics, and
conversion
technologies for
bioenergy*

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*products such as
biogas, ethanol,
butanol,
biodiesel, and
synthetic gases.
The book
discusses
anaerobic
digestion of
waste materials
for biogas and
hydrogen
production,
bioethanol and*

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*biobutanol
production from
starch and
cellulose, and
biodiesel
production from
plant oils. It
addresses
thermal
processes,
including
gasification and
pyrolysis of
agricultural*

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*residues and
woody biomass.
The text also
covers
pretreatment
technologies,
enzymatic
reactions,
fermentation,
and
microbiological
metabolisms and
pathways.*

The impending

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*threats of
catastrophic
climate change
and peak oil are
driving our
society towards
increased use of
biomass for
energy, chemical
compounds and
other materials
- the beginnings
of a biobased
economy. As*

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*alternative
development
models for the
biobased economy
emerge, we need
to determine
potential
applications,
their
perspectives and
possible impacts
as well as
policies that
can steer*

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*technological
and market
development in
such a way that
our objectives
are met.*

*Currently, it is
still far from
clear what will
be the most
sustainable
routes to
follow, which
technologies*

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should be included, and how their development will affect, and be affected by, research, public opinion and policy and market forces. This groundbreaking work, edited by a group of

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*leading
researchers
originally from
Wageningen
Agricultural
University in
the Netherlands,
sets out to
unpick the
complex systems
in play. It
provides an
illuminating
framework for*

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*how policy and
market players
could and should
drive the
development of a
biobased economy
that is
effective,
sustainable,
fair and cost
efficient.
Starting with a
state-of-the-art
overview of*

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major biobased technologies, including biorefinery and technologies for the production of biofuels, biogas, biomass feedstocks for chemistry and bioplastics, it discusses how different actor groups interact

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*through policy
and markets.
Information from
case studies is
used to
demonstrate how
the potential of
the biobased
economy in
different parts
of the world,
such as North
America, Europe,
and emerging*

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*economies like
China and Brazil
can be realised
using research,
debate, policy
and commercial
development. The
result is an
essential
resource for all
those working in
or concerned
with biobased
industries,*

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*their policy or
research.*

*Industrial
engineering is a
branch of
engineering
dealing with the
optimization of
complex
processes or
systems. It is
concerned with
the development,
improvement,*

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*implementation
and evaluation
of production
and service
systems.*

*Computational
Intelligence
Systems find a
wide application
area in
industrial
engineering:
neural networks
in forecasting,*

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*fuzzy sets in
capital
budgeting, ant
colony
optimization in
scheduling,
Simulated
Annealing in
optimization,
etc. This book
will include
most of the
application
areas of*

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*industrial
engineering
through these
computational
intelligence
systems. In the
literature,
there is no book
including many
real and
practical
applications of
Computational
Intelligence*

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Systems from the point of view of Industrial Engineering. Every chapter will include explanatory and didactic applications. It is aimed that the book will be a main source for MSc and PhD students.

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*Phytoremediation
Potential of
Perennial
Grasses provides
readers with the
knowledge to
select specific
perennial grass
species
according to
site-specific
needs. In
addition, it
demonstrates the*

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*potential
opportunities
for grass-based
phytoremediation
to yield
phytoproducts,
especially
biomass-based
bioenergy and
aromatic
essential oils
as a green
economy while in
the process of*

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*remediating
contaminated
sites. The book
brings together
recent and
established
knowledge on
different
aspects of grass-
based phytoremed-
iation,
providing this
information in a
single source*

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*that offers a
cutting-edge
synthesis of
scientific and
experiential
knowledge on
polluted site
restoration that
is useful for
both
practitioners
and scientists
in environmental
science and*

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ecology.

*Provides a
holistic
approach to
grass-based phyt
oremediation,
covering the
ecological,
economic and
social issues
related to its
management*

*Addresses the
key role that*

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*grass-based
phytoremediation
plays in
maintaining
ecosystem
services in
polluted sites
Includes
strategies to
mitigate costs
related to the
phytoremediation
of polluted
sites*

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The authors describe how sustainable textile fibers from crops such as quinoa, grass, hops, corn and wheat stems, etc. have recently begun to generate great interest. The structure-

property

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relationships of such non-conventional cellulose fibers are studied in this brief, as are their sorption and surface properties which are of primary importance. A systematic review of each

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fiber's properties is given, the emphasis is placed on the water sorption capacity, the fiber's surface potential, and fibrillation properties.

*Biomass to
Biofuels and
Waste to Energy*

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*Renewable Fuel
Standard
Prospects of
Renewable
Bioprocessing in
Future Energy
Systems
Sustainable
Management of
Contaminated
Sites
Biomass to
Renewable Energy
Processes*

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***Effects of
Miscanthus Grass
as a Fiber
Source in Pet
Diets on
Extrusion
Processing and
Diet Utilization
by Dogs and Cats***

This book gathers
review articles
that analyze
current

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agricultural issues and knowledge, then propose alternative solutions. It will therefore help all scientists, decision-makers, professors, farmers and politicians who wish to build a safe agriculture,

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energy and food system for future generations.

Interest in the use of biomass for non-food applications has grown strongly in recent years, mainly as a consequence of its potential as a prime renewable

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energy resource.
Renewable
energies rank
highly among the
options that will
contribute to the
prevention of
climate change
and to security of
energy supply in
the future.
Furthermore,
exploiting

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biomass is very attractive as a way of dealing with two sensitive issues facing the majority of western European countries today; the extent of unemployment and the setting aside of farm lands to limit

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excess

agricultural
production. The
8th European
Conference for
Energy,
Environment,
Agriculture and
Industry, held in
Vienna, October
1994 was larger
than any of its
predecessors,

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with over 300 refereed contributions from 20 countries worldwide and over 520 participants. It was arguably the most significant event to date in this field, providing the opportunity for an

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international exchange of information on the recent progress in developing and implementing renewable biomass based non-food technologies. Published in 3 volumes, the

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proceedings of
this conference
therefore contain
the most
complete
overview of the
present state-of-
the-art. Subjects
covered include:
biomass resource
base, electricity
and heat
generation,

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transportation
fuels, chemicals
from biomass,
products from
bio- and
thermochemical
conversion
technologies,
economics,
environmental
aspects and
opportunities for
implementation

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worldwide, in particular in developing countries. Apart from the numerous contributions on the most recent results in research, development and implementation, the publication

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also contains authoritative reviews on most of the above-mentioned areas from leading experts in each field. In addition to this, it contains a list of key issues for developing a successful

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strategy leading to a rapid implementation in Europe and abroad. As a result it is indispensable for anyone working in this area, whether in research, demonstration or in policy

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development.
Biofuel Crop
Sustainability
brings together
the basic
principles of
agricultural
sustainability and
special
stipulations for
biofuels, from the
economic and
ecological

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opportunities and challenges of sustainable biofuel crop production to the unique characteristics of particular crops which make them ideal for biofuel applications. This book will be a valuable resource

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for researchers
and professionals
involved in
biofuels
development and
production as well
as agriculture
industry
personnel.
Chapters focus
the broad
principles of
resource

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management for ecological, environmental and societal welfare, the sustainability issues pertaining to several broad categories of biofuel crops , as well as the economics and profitability of

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biofuels on both a local and international scale. Coverage includes topics such as utilizing waste water for field crop irrigation and algae production, reliability of feedstock supply, marginal lands,

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and identifying crops with traits of significance for survival and growth on low fertility soils. The development of production practices with low external inputs of fertilizer, irrigation, and pesticides is also

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covered. Biofuel
Crop

Sustainability will
be a valuable, up-
to-date reference
for all those
involved in the
rapidly expanding
biofuels industry
and sustainable
agriculture
research fields.
In the United

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States, we have come to depend on plentiful and inexpensive energy to support our economy and lifestyles. In recent years, many questions have been raised regarding the sustainability of our current

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pattern of high consumption of nonrenewable energy and its environmental consequences. Further, because the United States imports about 55 percent of the nation's consumption of crude oil, there

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are additional concerns about the security of supply. Hence, efforts are being made to find alternatives to our current pathway, including greater energy efficiency and use of energy sources that

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could lower greenhouse gas (GHG) emissions such as nuclear and renewable sources, including solar, wind, geothermal, and biofuels. The United States has a long history with biofuels and the nation is on a

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course charted to achieve a substantial increase in biofuels.

Renewable Fuel Standard evaluates the economic and environmental consequences of increasing biofuels

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production as a result of Renewable Fuels Standard, as amended by EISA (RFS2). The report describes biofuels produced in 2010 and those projected to be produced and consumed by 2022, reviews

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model projections
and other
estimates of the
relative impact on
the prices of land,
and discusses the
potential
environmental
harm and
benefits of
biofuels
production and
the barriers to

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achieving the
RFS2
consumption
mandate. Policy
makers,
investors, leaders
in the
transportation
sector, and others
with concerns for
the environment,
economy, and
energy security

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can rely on the recommendations provided in this report.

This volume presents a selection of papers from the WASTES 2015 conference, a platform for scientists and industries from

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the waste management and recycling sectors from around the world, who shared experiences and knowledge at the meeting.

Covering discussions regarding the balance between

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economic,
environmental
and social
outcomes, the
developme
Advances in
Botanical
Research
Bioenergy

Biofuels,
Materials and
Chemicals in the

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Post-oil Era
Sustainable
Agriculture
Volume 2
Selected Papers
from 27th
European
Biomass
Conference &
Exhibition (EUBCE
2019)

**The biomass
based energy**

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sector,

especially the
one based on
lignocellulosic
sources such as
switchgrass
Miscanthus,
forest residues
and short
rotation
coppice, will
play an
important role

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in our drive
towards
renewable
energy. The
biomass
feedstock
production
(BFP) subsystem
provides the
necessary
material inputs
to the
conversion

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processes for
energy
production.

This subsystem
includes the
agronomic
production of
energy crops
and the
physical
handling and
delivery of
biomass, as

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well as other
enabling
logistics.
Achieving a
sustainable BFP
system is
therefore
paramount for
the success of
the emerging
bioenergy
sector.

However, low

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bulk and energy
densities,
seasonal and
weather
sensitive
availability,
distributed
supply and lack
of commercial
scale
production
experience
create unique

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challenges .

Moreover, novel
region specific
feedstock
alternatives
continue to
emerge .

Engineering
will play a
critical role
in addressing
these
challenges and

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ensuring the
techno-economic
feasibility of
this sector. It
must also
integrate with
the biological,
physical and
chemical
sciences and
incorporate
externalities,
such as

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social/economic considerations, environmental impact and policy/regulatory issues, to achieve a truly sustainable system.

Tremendous progress has been made in the past few

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years while new
challenges have
simultaneously
emerged that
need further
investigation.
It is therefore
prudent at this
time to review
the current
status and
capture the
future

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challenges

through a
comprehensive
book. This work
will serve as
an
authoritative
treatise on the
topic that can
help
researchers,
educators and
students

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interested in
the field of
biomass
feedstock
production,
with particular
interest in the
engineering
aspects.

Gastrointestina
l health,
digesta
passage,

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regularity and consistency of elimination, and energy dilution of the diet can be affected by dietary fiber. Cellulose and beet pulp have been common fibers used in pet foods. Pet

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owners and pet
food companies
are in search
of
alternatives.

Miscanthus
grass is an
ingredient
produced from
the dried canes
of Miscanthus
giganteus, a C4
grass grown for

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its high fiber
content;
however, it has
not previously
been evaluated
in pet foods.
Thus, the
objectives were
to determine
the effect of
Miscanthus
grass on
processing,

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nutrient
utilization,
hairball
management, and
fermentation
end products.
Pet foods were
produced in a
pilot scale
extruder (E525,
Extru-Tech,
Sabetha, KS),
dried to less

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than 10%

moisture, then
coated with
chicken fat and
flavor
enhancer.

Extrusion
parameters
(preconditioner
and barrel
water and steam
addition,
preconditioner

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discharge

temperature,

screw speed,

die pressure,

diet

temperature,

knife speed,

specific

mechanical

energy, total

mass flow, and

wet bulk

density) and

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kibble

characteristics
(kibble length,
diameter,
volume,
density,
sectional
expansion ratio
index,
hardness, and
compression
energy) were
evaluated for

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dog and cat
foods produced
with 10%

Miscanthus

grass,

cellulose, or

beet pulp.

Miscanthus

grass and

cellulose dog

diets required

less specific

mechanical

Download Ebook Miscanthus For Energy And Fibre energy .

Additionally,
these two
canine diets
were less dense
than the beet
pulp containing
diet. Pet foods
were fed to
dogs and cats
to evaluate
nutrient
digestibility

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and stool
quality.

Generally, dry
matter, organic
matter, and
gross energy
digestibility
were lower for
animals fed
Miscanthus
grass and
cellulose diets
than beet pulp

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diet. However,
crude protein
digestibility
was higher for
animals fed
Miscanthus
grass and
cellulose diets
compared to
beet pulp diet.
In both dog and
cat studies,
feces were

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softer when
animals were
fed the beet
pulp diet. For
cats, hairball
management was
evaluated by
feeding a diet
with 10%

Miscanthus
grass versus a
non-fiber
containing

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control diet.

Most parameters
evaluated

(fecal hairball
count, hair
masses per day,
average

hairball size,
total hair

weight) were

not affected by
inclusion of

Miscanthus

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grass, but there was a trend for more hair collected on the strainer ($P = 0.0884$), less total hair per gram of dry feces, and less hair masses per gram of dry feces (P

The long-held

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tenets of the energy sector are being rewritten in the twenty-first century. The rise of unconventional oil and gas and of renewables is transforming our economies and improving

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our

understanding
of the
distribution of
the world's
energy
resources and
their impacts.
A complete
knowledge of
the dynamics
underpinning
energy markets

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is necessary
for decision-
makers

reconciling
economic,
energy, and
environmental
objectives.

Those that
anticipate
global energy
developments
successfully

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can derive an
advantage,
while those
that fail to do
so risk making
poor policy and
investment
decisions.

Focused on
solving the key
challenges
impeding the
realization of

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advanced

cellulosic

biofuels and

bioproducts in

rural areas,

Biomass and

Biofuels:

Advanced

Biorefineries

for Sustainable

Production and

Distribution

provides

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comprehensive
information on
sustainable
production of
biomass
feedstock,
supply chain
management of
feedstocks to
the biorefinery
site, advanced
conversion
processes, and

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catalysts/bioca
talysts for
production of
fuels and
chemicals using
conventional
and integrated
technologies.
The book also
presents
detailed
coverage of
downstream

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processing, and
ecological
considerations
for refineries
processing
lignocellulosic
and algal
biomass
resources.
Discussions of
feedstock raw
materials,
methods for

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biomass

conversion, and
its effective
integration to
make
biorefinery
more
sustainable -
economically, e
nvironmentally,
and socially -
give you the
tools to make

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informed

decisions.

Natural plant

fibers fibres

are being

increasingly

used in

manufacturing

industrial

products

because of

their renewable

and

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biodegradable
natures. Kenaf
is an annual
bast fibre crop
that can
provide fibres
for several
industrial
applications
(composites,
insulation
mats,
absorbents,

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bedding
material, etc.)
as well as raw
material for
energy
exploitation
(solid
biofuels) .

Kenaf: A Multi-
Purpose Crop
for Several
Industrial
Applications

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introduces the
physiology and
field
management of
kenaf,
agronomy,
productivity,
harvesting as
well as its the
industrial and
energy uses of
this promising
non-food crop.

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Including
recent research
collected by
the BIOKENAF
project, Kenaf:
A Multi-Purpose
Crop for
Several
Industrial
Applications
provides a
global picture
of state of the

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art research
and
developments
with Kenaf from
Asia, USA and
Australia. This
thorough
introduction if
followed up
with an
assessment of
the crops
economic

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viability as well as an the environmental impact assessment of kenaf. Although not a new crop, Kenaf: A Multi-Purpose Crop for Several Industrial Applications provides a

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comprehensive
introduction to
this crop and
its developing
applications
for energy
engineers,
industry
managers,
politicians and
managers
working to
develop

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sustainable
energy sources
and bio-
economies.

Despite major
international
investment in
biofuels, the
invasive risks
associated with
these crops are
still unknown.

A cohesive stat

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e-of-the-art
review of the
invasive
potential of
bioenergy
crops, this
book covers the
identified
risks of
invasion,
distributions
of key crops
and policy and

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management

issues.

Including a section on developing predictive models, this book also assesses the potential societal impact of bioenergy crops and how

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to mitigate
invasive risks.
Renewable and
Alternative
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professionals in the bioenergy field with valuable, practical information that can be applied to implementing renewable energy projects, choosing among competing feedstocks, technologies, and products. It also serves as a basic

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biobased renewable energy world. •

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including organic
waste of all kinds. •

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comprehensive
overview and in-
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resources: solid
(wood energy, grass
energy, waste, and
other biomass),
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Production, Uses,
Sustainability and
Markets for Giant
Reed, Miscanthus,
Switchgrass, Reed
Canary Grass and
Bamboo brings
together a team of
international authors
to explore the

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current utilization, sustainability and future perspectives of perennial grasses in the bioeconomy. The book begins by examining the role of these crops as feedstock for bioenergy, in particular advanced biofuels and bioproducts. It then

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offers five chapters, each covering one perennial grass type, namely giant reed, miscanthus, switchgrass, reed canary grass and bamboo. The book covers their breeding, cultivation, harvesting, pre-treatment,

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economics and
characterization.

The book goes on to
present the
thermochemical
conversion
pathways for
different types of
feedstock. The last
chapter explores
issues concerning
sustainability of
perennial grasses,

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including their
production in
marginal lands. This
thorough overview
is a helpful
reference for
engineering
researchers and
professionals in the
bioenergy sector,
whose
understanding of
feedstock

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characterization, sustainability and production is critical in the development of conversion technologies. Those in the industrial crops sector will benefit from discussion of various issues surrounding crop production, which

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can guide their feedstock cultivation, harvesting and pre-treatment for specific conversion processes or end use. The book is also a useful resource for instructors and students in Masters and PhD programs

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in the area of biomass and energy crops. Policy makers and government agents involved in regulating the bioenergy and bioproducts sector will find comprehensive information to guide their decision

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making. Explores the whole value chain of grassy feedstock for advanced biofuels and bioproducts, from cultivation to end use, including biomass characterization (physical properties, chemical composition, etc.)

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and conversion and
sustainability

Examines the
sustainability and
economic factors
related to perennial
grasses and their
conversion into
biofuels and
bioproducts

Includes a complete
list of grasses
relevant for energy

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uses, and tables
with their current
and expected future
uses and markets
The Role of
Catalysis for the
Sustainable
Production of Bio-
fuels and Bio-
chemicals describes
the importance of
catalysis for the
sustainable

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production of biofuels and biochemicals, focused primarily on the state-of-the-art catalysts and catalytic processes expected to play a decisive role in the "green" production of fuels and chemicals from biomass. In

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In addition, the book includes general elements regarding the entire chain of biomass production, conversion, environment, economy, and life-cycle assessment. Very few books are available on catalysis in production schemes

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using biomass or its primary conversion products, such as bio-oil and lignin.

This book fills that gap with detailed discussions of:

Catalytic pyrolysis of lignocellulosic biomass Hybrid biogasoline by co-processing in FCC units Fischer-

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Tropsch synthesis
to biofuels (biomass-
to-liquid process)
Steam reforming of
bio-oils to hydrogen
With energy prices
rapidly rising,
environmental
concerns growing,
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apparatus evolving,
this book is a
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value for chemists,
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catalytic reaction
mechanism
schemes and gives
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understanding of
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Includes flow

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diagrams of bench-, pilot- and industrial-scale catalytic processing units and demonstrates the various process technologies involved, enabling easy selection of the best process. Incorporates many tables, enabling easy comparison of

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data based on a critical review of the available literature. By the end of the twenty-first century it is thought that three-quarters of the world's population will be urban; our future is in cities. Making these cities healthy, vibrant and sustainable is an

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increasing
movement of
scientists and
engineers who are
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composite
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importance at every stage of a product's life, from initial synthesis through to final disposal and a sustainable society needs environmentally safe materials and processing methods. With an

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examines fibre
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production and
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stage of the life cycle. The introductory chapters look at why we should consider green composites, their design and life cycle assessment. The properties of natural fibre sources such as

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cellulose and wood
are then discussed.

Chapter 6

examines

recyclable

synthetic fibre-

thermoplastic

composites as an

alternative solution

and polymers

derived from

natural sources are

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covered in Chapter 7. The factors that influence the properties of these natural composites and natural fibre thermoplastic composites are detailed in Chapters 8 and 9. The final four chapters consider

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clean processing,
applications,
recycling,
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Green composites
is an essential
guide for
agricultural crop
producers,
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