

## System Of Crop Intensification For Diversified And

Microirrigation has become the fastest growing segment of the irrigation industry worldwide and has the potential to increase the quality of food supply through improved water fertilizer efficiency. This book is meant to update the text "Trickle Irrigation, Design, Operation and Management". This text offers the most current understanding of the management criteria needed to obtain maximum water and fertilization efficiency. \* Presents a detailed explanation of system design, operation, and management specific to various types of MI systems \* Analyzes proper use of irrigation technology and its effect to increase efficiency \* Provides an understanding to the basic science needed to comprehend operation and management \* Over 150 figures of designs and charts of systems including, surface drip, subsurface drip, spray/microsprinkler, and more

Malawi's smallholder agricultural production is a maize-mixed system following the unimodal rainfall system, prone to climate shocks causing variable crop yields that increase food insecurity. Smallholder farmers make decisions on crop and farm management based on resource availability as well as socio-economic and environmental factors. The government of Malawi has made efforts to improve agricultural production through fertilizer subsidies and the promotion of sustainable farm practices such as legume intercropping and crop residue management practices for soil fertility enhancement. Such efforts are part of the Sustainable Intensification (SI) of Agriculture pathway widely supported across Africa as a means to increase food and agricultural production. The purpose of this research is to examine Malawi's agriculture through a multi-scale lens; national, sub-regional and local recognizing the spatial-

## Where To Download System Of Crop Intensification For Diversified And

temporal environmental and social drivers occurring across agro-ecologies and influencing smallholder farmers and their capacity for sustainable food production. We assess spatial patterns of Malawian productivity using decadal (2006-2017) climate, edaphic properties, and vegetation indexes, where spatially-located positive trends discrete from climate are presented as evidence of where Intensification (SI) of agriculture is taking place. Secondly, a baseline study that captures farmer demographics and farm practices from randomly stratified sites with varying agro-ecologies is carried out to better understand the contemporary Malawian farmer, the environment within which they produce food, and their overall potential for sustainable agriculture. Land Use Land Cover (LULC) change analyses and landscape quantification of agricultural intensification patterns and their underlying landscape processes are assessed for evidence of sustainable practices. Additionally, we elucidate the landscape patterns of the SI of agriculture associated with Malawi's agricultural extension delivery system. The main findings show evidence of positive spatial trends in Malawi's agricultural productivity that are not influenced by mesic climatic signals. This is consistent with evidence of farmer managed agricultural intensification. At the sub-regional scale, there are few land use changes in Central Malawi's Dedza and Ntcheu districts from 2014 to 2019 demonstrating the stability and maturity of this traditional agricultural landscape. However, overall land fragmentation has increased, particularly in land classified as agroforestry and shrubs/forests classes possibly indicating increased use of sustainable farming practices. Smallholders in central Malawi seek location specific agricultural advice on cropping systems and soil nutrient management recommendations. Effective delivery of advice by extension, responsive to farmer goals, could potentially boost farmer adoption of SI technologies.

## Where To Download System Of Crop Intensification For Diversified And

A joint FAO and World Bank study which shows how the farming systems approach can be used to identify priorities for the reduction of hunger and poverty in the main farming systems of the six major developing regions of the world.

The System of Crop Intensification Agroecological Innovations for Improving Agricultural Production, Food Security, and Resilience to Climate Change

Soil Health and Intensification of Agroecosystems examines the climate, environmental, and human effects on agroecosystems and how the existing paradigms must be revised in order to establish sustainable production. The increased demand for food and fuel exerts tremendous stress on all aspects of natural resources and the environment to satisfy an ever increasing world population, which includes the use of agriculture products for energy and other uses in addition to human and animal food. The book presents options for ecological systems that mimic the natural diversity of the ecosystem and can have significant effect as the world faces a rapidly changing and volatile climate. The book explores the introduction of sustainable agroecosystems that promote biodiversity, sustain soil health, and enhance food production as ways to help mitigate some of these adverse effects. New agroecosystems will help define a resilient system that can potentially absorb some of the extreme shifts in climate. Changing the existing cropping system paradigm to utilize natural system attributes by promoting biodiversity within production agricultural systems, such as the integration of polycultures, will also enhance ecological resiliency and will likely increase carbon sequestration. Focuses on the intensification and integration of agroecosystem and soil resiliency by presenting suggested modifications of the current cropping system paradigm Examines climate, environment, and human effects on agroecosystems Explores in depth the wide range of intercalated soil and

## Where To Download System Of Crop Intensification For Diversified And

plant interactions as they influence soil sustainability and, in particular, soil quality Presents options for ecological systems that mimic the natural diversity of the ecosystem and can have significant effect as the world faces a rapidly changing and volatile climate

Introduction: the state of rice in post-green-revolution Asia; Rice productivity growth: the case against complacency; Sustaining farm profits through technical change; Intensification-induced degradation of the paddy resource base; Erosion, pollution and poison: externalities and rice; Asian rice market: demand and supply prospects; GATT and rice: impact on the rice market and implications for research priorities; Agricultural commercialization and farmer product choices: the case of diversification out of rice; Strategic look at factor markets and the organization of agricultural production beyond 2025; Post-green-revolution seed technology for intensive rice systems; Fertilizers and pesticides: higher levels versus improved efficiencies; Dealing with labor scarcity: mechanical technologies.

This book outlines a new paradigm, Sustainable Intensification of Crop Production (SICP), which aims to produce more from the same area of land by increasing efficiency, reducing waste, conserving resources, reducing negative impacts on the environment and enhancing the provision of ecosystem services. The use of ecologically based management strategies can increase the sustainability of agricultural production while reducing off-site consequences. The book also highlights the underlying principles and outlines some of the key management practices and technologies – such as minimum soil disturbance; permanent organic soil covers; species diversification; selection of suitable cultivars, planting time, age and spacing; balanced plant nutrition; agro-ecological pest management; efficient water management; careful management of farm machinery; and integrated crop-livestock production – required to

## Where To Download System Of Crop Intensification For Diversified And

implement SICP. The green revolution (by using high-yielding crop varieties, mono-cropping, fertilization, irrigation, and pesticides) has led to enormous gains in food production and improved world food security. In many countries, however, intensive crop production has had negative impacts on production, ecosystems and the larger environment, putting future productivity at risk. In order to meet the projected demands of a growing population expected to exceed 9 billion by 2050, farmers in the developing world must double food production, a challenge complicated by the effects of climate change and growing competition for land, water and energy. This book will be of immense value to all members of the scientific community involved in teaching, research and extension activities concerning sustainable intensification. The material can be used for teaching post-graduate courses, or as a useful reference guide for policy makers.

Continued population growth, rapidly changing consumption patterns and the impacts of climate change and environmental degradation are driving limited resources of food, energy, water and materials towards critical thresholds worldwide. These pressures are likely to be substantial across Africa, where countries will have to find innovative ways to boost crop and livestock production to avoid becoming more reliant on imports and food aid. Sustainable agricultural intensification - producing more output from the same area of land while reducing the negative environmental impacts - represents a solution for millions of African farmers. This volume presents the lessons learned from 40 sustainable

## Where To Download System Of Crop Intensification For Diversified And

agricultural intensification programmes in 20 countries across Africa, commissioned as part of the UK Government's Foresight project. Through detailed case studies, the authors of each chapter examine how to develop productive and sustainable agricultural systems and how to scale up these systems to reach many more millions of people in the future. Themes covered include crop improvements, agroforestry and soil conservation, conservation agriculture, integrated pest management, horticulture, livestock and fodder crops, aquaculture, and novel policies and partnerships.

Lesotho is a small mountainous country characterized by extensive land degradation and erratic climatic conditions. In recent years a growing number of development agencies have been promoting conservation agriculture (CA). The present case study draws on the data collected by FAO in 2006 and illustrates the impact of the local version of CA, the likoti-system, on sustainable crop intensification in the south-eastern highlands and in the western lowlands of Butha-Buthe and Berea. According to these data, the adoption of likoti has brought about significant advantages compared to conventional tillage. This publication is directed to decision makers as well as readers interested in sustainable agriculture.--Publisher's description.

The Mali Africa Research in Sustainable Intensification for the Next Generation

## Where To Download System Of Crop Intensification For Diversified And

(Africa RISING) Baseline Evaluation Survey (MARBES) survey was implemented during May-July 2014 as part of IFPRI's Monitoring and Evaluation (M&E) of Africa RISING. The Africa RISING program aims to create-through action research and development partnerships-opportunities for smallholder farmers in Africa south of the Sahara to sustainably intensify their farming systems and to improve their food, nutrition, and income security. Initiated in 2012, the program is supported by the United States Agency for International Development (USAID) as part of the U.S. government's Feed the Future (FTF) initiative. As part of the program, the International Institute of Tropical Agriculture (IITA) leads a sustainable intensification effort focusing on the cereal-based farming systems in the Guinea Savannah Zone of West Africa (Ghana and Mali) and East and Southern Africa (Malawi, Tanzania, and Zambia) while the International Livestock Research Institute (ILRI) leads the research activities focusing on the crop-livestock systems of the Ethiopian highlands. The International Food Policy Research Institute (IFPRI) has been tasked with M&E of the three projects. Mali Africa RISING is being implemented in Bougouni, Yanfolila and Koutiala cercles (the cercle is a type of administrative region), in the Sikasso region of Mali, within the FTF Zones of Influence. The research activities are led by IITA, the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), ILRI,

## Where To Download System Of Crop Intensification For Diversified And

the Asian Vegetable Research and Development Center (AVRDC), and the International Center for Research in Agroforestry or World Agroforestry Center (ICRAF), as well as local partners: L'Association Malienne d'Eveil et de Développement Durable (AMEDD), l'Association Malienne pour la Sécurité et la Souveraineté Alimentaires (AMASSA), and Mouvement Biologique du Mali (MOBIOM). MARBES collected detailed household- and plot-crop level data addressing various topics: employment (agricultural and non-agricultural); health; agricultural land; crop inputs, harvest, storage, and sale; livestock ownership, feed, and water; agriculture-related challenges and coping strategies; credit and off-farm income sources; housing conditions and ownership of various durable assets; subjective welfare and food security; household-level food consumption; non-food expenditure; agricultural shocks; and child and women anthropometry. The community survey collected data on access to basic services; access to extension services; social organizations, mobility, and village-level shocks; access to natural resources; metric conversion units; and prices of crops and food items. MARBES covered 705 households and 20 communities drawn from the three project cercles. Data was collected using structured questionnaires in multiple local languages through Computer Assisted Personal Interviewing, using the Census and Survey Processing System (CSPPro).

## Where To Download System Of Crop Intensification For Diversified And

Sustainable intensification has recently been developed and adopted as a key concept and driver for research and policy in sustainable agriculture. It includes ecological, economic and social dimensions, where food and nutrition security, gender and equity are crucial components. This book describes different aspects of systems research in agriculture in its broadest sense, where the focus is moved from farming systems to livelihoods systems and institutional innovation. Much of the work represents outputs of the three CGIAR Research Programs on Integrated Systems for the Humid Tropics, Aquatic Agricultural Systems and Dryland Systems. The chapters are based around four themes: the conceptual underpinnings of systems research; sustainable intensification in practice; integrating nutrition, gender and equity in research for improved livelihoods; and systems and institutional innovation. While most of the case studies are from countries and agro-ecological zones in Africa, there are also some from Latin America, Southeast Asia and the Pacific.

This publication reports on current work in progress to raise the agricultural productivity of a wide range of crops, in eco-friendly ways and in a number of countries around the world, using an agroecological methodology called the System of Crop Intensification (SCI). Through a shift in plant management, SCI allows farmers to increase their production while simultaneously reducing

## Where To Download System Of Crop Intensification For Diversified And

purchased inputs, building soil health, reducing water use, and making plants more resilient to climate change-induced stress.

System of Rice Intensification (SRI) is a novel methodology originated in Madagascar during 1983 and spread all over the world. In the recent past, the successful SRI practices are being extrapolated to other crops in the name of System of Crop Intensification (SCI). The SCI practices also proved to increase the yield levels more than two times. In pursuit of extending the beneficial effect of SRI to SCI in greengram, the present study was programmed. Greengram is one of the important food legumes grown in India and emerged as a nutritive and remunerative pulse crop, capable of providing the quickest return in the shortest possible time besides offering nutritional security to millions of people. By virtue of its superior nutritional quality, short duration and high monetary return, greengram can be grown as intercrop and rice-fallow crop especially by small and marginal farmers. Adoption of SCI practices may enhance the productivity and reduce the gap between per capita availability and consumption; and in turn possible to contribute to nutritional security of the world.

This volume addresses three important agricultural aspects of rice: physical characteristics, physico-chemical characteristics, and the organoleptic aspects. Divided into sections, the book first examines recent trends and advances for

## Where To Download System Of Crop Intensification For Diversified And

higher production and quality improvement, focusing on the effects of climate on rice cultivation and climate-resilient agricultural practices in rice. The volume goes on to cover nutrient management for rice production and quality improvement. Chapters also address weed management and postharvest processing practices for improved rice production. With chapters from renowned scientists, researchers, and professors, this book will be a useful reference for rice researchers working in the area of agronomic practices, postharvest processing, and quality improvement in rice.

Intensive multiple cropping. The food formula for hungry Asia. Population and food problems in Asia. The untapped tropicla production reservoir. Agricultural production resources in Asia. Increased production pathways. Increased production pathways. Crop intensification prospects in Asia. Agricultural research in Asia. The Asian cropping systems network. Early multiple cropping in Asia. The formation of an Asian cropping systems network. Cropping systems concepts and approaches. Methodology development. IRRI's role in the network. Future plants for the network. The setting of cropping systems research in Asia. The Asia Cropping systems network research sites. On-farm research setting in the country research sites. Traditional cropping systems in Asia.Characteristics of a typical Asian farmer. Major field crops in Asia. Cropping systems in rainfed

## Where To Download System Of Crop Intensification For Diversified And

wetland areas. Irrigated wetland areas. Rainfed dryland areas. Irrigated dryland areas. Deepwater rice areas. Tidal swamp areas. Agroforestry areas. Hill agriculture areas. Design and testing of improved cropping systems. Rainfed wetland sites. Irrigated wetland sites. Rainfed dryland sites. Deepwater sites. Tidal swamp sites. Hill agriculture areas. Cropping system research and area development. Multilocation testing. Pilot production programs. The impact of cropping systems research on the small farms. General impact. Increased production. Impact on income level. Increased employment. Impact on land utilization. Technology transfer.

Explore an in-depth and insightful collection of resources discussing various aspects of root structure and function in intensive agricultural systems. The Root Systems in Sustainable Agricultural Intensification delivers a comprehensive treatment of state-of-the-art concepts in the theoretical and practical aspects of agricultural management to enhance root system architecture and function. The book emphasizes the agricultural measures that enhance root capacity to develop and function under a range of water and nutrient regimes to maximize food, feed, and fibre production, as well as minimize undesirable water and nutrient losses to the environment. This reference includes resources that discuss a variety of soil, plant, agronomy, farming system, breeding, molecular

## Where To Download System Of Crop Intensification For Diversified And

and modelling aspects to the subject. It also discusses strategies and mechanisms that underpin increased water- and nutrient-use efficiency and combines consideration of natural and agricultural systems to show the continuity of traits and mechanisms. Finally, the book explores issues related to the global economy as well as widespread social issues that arise from, or are underpinned by, agricultural intensification. Readers will also benefit from the inclusion of: A thorough introduction to sustainable intensification, including its meaning, the need for the technology, components, and the role of root systems Exploration of the dynamics of root systems in crop and pasture genotypes over the last 100 years Discussion of the interplay between root structure and function with soil microbiome in enhancing efficiency of nitrogen and phosphorus acquisition Evaluation of water uptake in drying soil, including balancing supply and demand Perfect for agronomists, horticulturalists, plant and soil scientists, breeders, and soil microbiologists, *The Root Systems in Sustainable Agricultural Intensification* will also earn a place in the libraries of advanced undergraduate and postgraduate students in this field who seek a one-stop reference in the area of root structure and function.

Over 70% of Tanzanians live on less than \$2 per day and over 75% of the population is involved in agriculture. Increasing agricultural productivity is seen as

## Where To Download System Of Crop Intensification For Diversified And

a way to decrease poverty and stimulate the economy. Sustainable Intensification (SI) is widely promoted as a means to sustainably increase agricultural production for smallholder farmers. Practices considered being SI should increase productivity on the same land with more efficient use of resources, in a way that minimizes negative effects on the environment. The objectives of these studies were to evaluate SI practices for their effect on agronomic productivity and soil quality for smallholder farmers in Tanzania. Further, these studies sought to identify the impact that these practices have on smallholder farmer profitability and water management within an irrigation scheme. These objectives were achieved through experiments carried out at three locations over three growing seasons within the Lower Moshi Irrigation Scheme (LMIS) in Mabogini Village, Kilimanjaro Region, United Republic of Tanzania. The studies each evaluated improved cropping systems that are appropriate for various areas within the scheme. The first three studies evaluated the System of Rice Intensification (SRI), crop rotations and nutrient management strategies, and reduced tillage for their effect on agronomic productivity and soil quality. Two further studies evaluated the profitability of SRI and the occurrence of dry spells in the region and the implications this has for rainfed maize (*Zea mays*) production. Within continuous rice (*Oryza sativa*), SRI and conventional

## Where To Download System Of Crop Intensification For Diversified And

had similar yields to those under conventional practices in the region except for during the last season, in which SRI systems yielded on average 1.25 Mg ha<sup>-1</sup> higher than conventional systems. If SRI is adopted throughout the LMIS, there is potential to increase rice production by 4,173 Mg due to increased water use efficiency and the ability to increase the area under rice production. This translates into a potential net income in the region of \$622,000 annually. The study evaluating crop rotations indicated that improved nutrient management resulted in higher yields regardless of other management practices. However, in rice-maize rotations, these studies indicate that bulk density and effective rooting depth issues will need to be addressed over the long term as they both violate critical limits established for maize production in tropical soils. The dry spell occurrence analysis indicated that the region is under a dry spell of greater than 15 days for 63% of the seasons analyzed. However, while maize yields under reduced tillage and supplemental irrigation were not significantly different from conventional tillage, all treatments received supplemental irrigation and yields ranged from 3.5-4.1 Mg ha<sup>-1</sup>—4 fold higher than current farmer yields. While rainfed maize is not feasible in the region, effective water management and supplemental irrigation can increase production in the area and should be explored further. Results from all the studies underline the importance of field-

## Where To Download System Of Crop Intensification For Diversified And

testing agricultural technologies within the context they are to be promoted and used. Overall, SI practices can be appropriate to farmers in the region but will require modification to ensure long-term sustainability.

Banana is an important staple commodity for developing countries, apart from wheat, rice or corn, hence its relevance for food security. Being adapted to grow under low light intensities, banana plants can withstand shade and hence are highly suitable for high density planting. The spatial arrangement of plants in a plantation is very important & usually involves a choice between physiological efficiency and practical utility. Increasing spacing between pits and planting more than one sucker per pit will help to reduce the cost of cultivation & enable inter cropping thereby improving total returns. Selection of crops for inter cropping and the geometry of planting should be designed in such a way that land, water & solar energy are fully utilized. Banana being a heavy remover of nutrients, high yields of quality bananas can only be sustained through application of optimal doses of nutrients in balanced proportion. Existing technologies of nutrient supply are to be refined for judicious use to enhance the profitability under double sucker planting as increased manurial dose may not be required for increased number of suckers per pit. Modified HDP with efficient use of inputs are explored. The System of Rice Intensification, known as SRI, is a management strategy for

## Where To Download System Of Crop Intensification For Diversified And

crop improvement. Its ideas, insights and practices are based on scientifically validated knowledge for increasing the production of not only irrigated rice but of other crops as well. SRI represents a paradigm shift in agricultural thinking and practice toward agroecological farming that can be used by even the poorest smallholding farmers in ecologically fragile regions of the world to achieve food security in the face of the climate-change challenges ahead. When the author Norman Uphoff first learned about SRI in Madagascar in 1993, this production system which offered higher yields with reduced inputs seemed implausible to him. But the professor put aside his skepticism after seeing farmers who had been getting rice yields of just two tons per hectare produce four times more rice for three years in a row on their very poor soils, not changing their varieties or relying on agrochemical inputs, and using less water. Now, he's helping to disseminate this dramatically effective methodology with this accessible, easy-to-use sourcebook. It offers explanations, research references, vivid pictures, and concrete examples of the award-winning SRI methodology to anyone interested in the development of practicable sustainable food systems. Now, he's helping to disseminate this revolutionary methodology with this accessible, easy-to-use primer. It offers explanations, resources, and concrete examples of the award-winning SRI to anyone interested in the development of practicable sustainable

## Where To Download System Of Crop Intensification For Diversified And

food systems.

The general formula for economic evaluation of crop sequence and relay intercropping systems from the perspective of crop intensification has been established on the basis of biological and economical parameters . This formula has possibilities for evaluating all the crop sequence and relay intercropping systems because it has included the factors that intervene in the agriculture process . It is considered one of the features proposed equivalences that can predict how the success or failure of the proposed system through price policy of inputs on the market . So, the spread of the implementation of the proposed programs in pursuing the market prices can be monitored . In order to clarify the importance of the equation used in the text, it had been begun to explain the crop sequence and relay intercropping systems and their practices as well as numerical examples were done in this book . The factors which are influential on the system choice for succession and The agricultural growing seasons in the world have been mentioned too.

"Southeastern Nigeria has some of the highest population densities in Sub-Saharan Africa and one of the most threatened ecosystems on the continent: the rainforests of West Africa. As population pressure has mounted, fallow periods have declined... Instead of doggedly pursuing old strategies, farmers shifted their

## Where To Download System Of Crop Intensification For Diversified And

agricultural practices in the face of mounting population pressures. Farmers have intensified their traditional bush-fallow cultivation system by adopting several strategies..." What agrobiodiversity is, what it does, and its importance to the environment and agriculture form the bases of discussion in this volume. Agrobiodiversity is defined as biological resources that directly and indirectly contribute to crop and livestock production. With the need to increase food production and to concurrently protect the environment a worldwide priority, agrobiodiversity is arguably the single most important natural resource. It is key to transforming agricultural systems that are currently wreaking havoc on wildlife and human health. This report highlights case studies in which modern and traditional agriculture has successfully transformed to enhance biodiversity without sacrificing yield. Lessons learned from this review help to identify sound practices for designing and monitoring agricultural projects so that they improve rural incomes while safeguarding environmental assets, particularly biodiversity. Suggestions for sound practices include modifications of the policy environment and ways to strengthen research institutions and extension services so that agriculture can be intensified while better protecting and managing biological resources.

Addressing a topic of major importance to the maintenance of world food supplies, this

## Where To Download System Of Crop Intensification For Diversified And

reference identifies knowledge gaps, defines priorities, and formulates recommendations for the improvement of the rice-wheat farming system. The book reveals new systems of rice intensification and management and illustrates the application of no-till and conservation farming to the rice-wheat system. With contributions from 65 international experts, and case studies from India, Nepal, Pakistan, and Bangladesh, Sustainable Agriculture and the International Rice-Wheat System focuses on seeding equipment and residue management, weed control, water and nutrient efficiency, and integrated pest management.

Sustainable crop production from limited land resource is the key concern of this millennium. With the shrinking of per-capita land availability, the only option available is to enhance production by crop intensification for increasing the input use efficiency. Intercropping is the one among the various approaches which provides an opportunity to increase the production & productivity of the cereals, particularly of Maize. This system involves growing two or more crops simultaneously with distinct row arrangement for complementary use of natural resources to enhance the productivity. Intercropping system provides substantial yield advantage over solo crop due to temporal and spatial complementarities and minimizes inter/intra specific competition. The objective to adopt such cropping practice is to reduce the risk of main crop failure due to uncertain factors and to have variation of produce for food and to feed the requirement of the farmers, family and animals besides meeting the cash requirement.

Fertilizer application can increase crop yields and improve global food security, and thus has the potential to eliminate hunger and poverty. However, excessive amounts of fertilizer application can contribute to groundwater pollution, greenhouse gas emissions, eutrophication,

## Where To Download System Of Crop Intensification For Diversified And

deposition and disruptions to natural ecosystems, and soil acidification over time. Small farmers in many countries think inorganic fertilizers are expensive and degrade soils, and thus policymakers want to promote organic instead of inorganic fertilizers. To develop practical fertilizer recommendations for farmers, yield responses to applied fertilizers from inorganic and organic sources, indigenous nutrient supply from soil, and nutrient use efficiency require consideration. There is a lack of sufficient scientific understanding regarding the need and benefit of integrated nutrient management (i.e., judicious use of inorganic and organic sources of nutrients) to meet the nutrient demand of high-yielding crops, increase yields and profits, and reduce soil and environmental degradation. Inadequate knowledge has constrained efforts to develop precision nutrient management recommendations that aim to rationalize input costs, increase yields and profits, and reduce environmental externalities. This Special Issue of the journal provided some evidence of the usefulness of integrated nutrient management to sustain soil resources and supply nutrients to crops grown with major cereal and legume crops in some developing countries.

Sustainable intensification (SI) has emerged in recent years as a powerful new conceptualisation of agricultural sustainability and has been widely adopted in policy circles and debates. It is defined as a process or system where yields are increased without adverse environmental impact and without the cultivation of more land. Co-written by Jules Pretty, one of the pioneers of the concept and internationally known and respected authority on sustainable agriculture, this book sets out current thinking and debates around sustainable agriculture and intensification. It recognises that world population is increasing rapidly, so that yields must increase on finite land and other resources to maintain food security. It provides

## Where To Download System Of Crop Intensification For Diversified And

the first widely accessible overview of the concept of SI as an innovative approach to agriculture and as a key element in the transition to a green economy. It presents evidence from around the world to show how various innovations are improving yields, resilience and farm incomes, particularly for 'resource constrained' smallholders in developing countries, but also in the developed world. It shows how SI is a fundamental departure from previous models of agricultural intensification. It also highlights the particular role and potential of small-scale farmers and the fundamental importance of social and human capital in designing and spreading effective innovations.

The humid highlands in sub-Saharan Africa (SSA) are characterized by high population densities and require intensification. The Consortium for Improving Agriculture-based Livelihoods in Central Africa (CIALCA) has set up a research for development platform in various mandate areas in DR Congo, Burundi, and Rwanda, aiming to identify improved production, market, and nutrition options and facilitating the access for development partners to these options. This platform is supported by capacity building, multi-stakeholder dialogue, and monitoring and evaluation efforts. The conference, facilitated by CIALCA, aimed to (i) take stock of the state-of the art in agricultural intensification in the highlands of SSA and (ii) chart the way forward for agricultural research for development in the humid highlands of SSA, and more specifically in the recently launched Humidtropics Consortium Research Programme, through keynote, oral and poster presentations, and strategic panel discussions.

There is an urgent need to increase agricultural productivity in sub-Saharan Africa in a sustainable and economically-viable manner. Transforming risk-averse smallholders into business-oriented producers that invest in producing surplus food for sale provides a

## Where To Download System Of Crop Intensification For Diversified And

formidable challenge, both from a technological and socio-political perspective. This book addresses the issue of agricultural intensification in the humid highland areas of Africa – regions with relatively good agricultural potential, but where the scarce land resources are increasingly under pressure from the growing population and from climate change. In addition to introductory and synthesis chapters, the book focuses on four themes: system components required for agricultural intensification; the integration of components at the system level; drivers for adoption of technologies towards intensification; and the dissemination of complex knowledge. It provides case studies of improved crop and soil management for staple crops such as cassava and bananas, as well as examples of how the livelihoods of rural people can be improved. The book provides a valuable resource for researchers, development actors, students and policy makers in agricultural systems and economics and in international development. It highlights and addresses key challenges and opportunities that exist for sustainable agricultural intensification in the humid highlands of sub-Saharan Africa. The book offers a rich toolkit of relevant, adoptable ecosystem-based practices that can help the world's 500 million smallholder farm families achieve higher productivity, profitability and resource-use efficiency while enhancing natural capital. Ecological intensification involves using natural resources such as land, water, soil nutrients, and other biotic and abiotic variables in a sustainable way to achieve high performance and efficiency in agricultural yield with minimal damage to the agroecosystems. With increasing food demand there is high pressure on agricultural systems. The concept of ecological intensification presents the mechanisms of ensuring

## Where To Download System Of Crop Intensification For Diversified And

high agricultural productivity by restoration the soil health and landscape ecosystem services. The approach involves the replacement of anthropogenic inputs with eco-friendly and sustainable alternates. Effective ecological intensification requires an understanding of ecosystems services, ecosystem's components, and flow of resources in the agroecosystems. Also, awareness of land use patterns, socio-economic factors, and needs of the farmer community plays a crucial role. It is therefore essential to understand the interaction of ecosystem constituents within the extensive agricultural landscape. The editors critically examined the status of ecological stress in agroecosystems and address the issue of ecological intensification for natural resources management. Drawing upon research and examples from around the world, the book is offering an up-to-date account, and insight into the approaches that can be put in practice for poly-cropping systems and landscape-scale management to increase the stability of agricultural production systems to achieve Ecological resilience. It further discusses the role of farmer communities and the importance of their awareness about the issues. This book will be of interest to teachers, researchers, climate change scientists, capacity builders, and policymakers. Also, the book serves as additional reading material for undergraduate and graduate students of agriculture, forestry, ecology, agronomy, soil science, and environmental sciences. National and international agricultural scientists, policymakers will also find this to be a useful read for green future.

## Where To Download System Of Crop Intensification For Diversified And

Sustainable Intensification (SI) has recently emerged as a key concept for agricultural development, recognising that yields must increase to feed a growing world population, but it must be achieved without damage to the environment, on finite land resources and while preserving social and natural capital. It also recognises that all initiatives must cope with the challenges of climate change to agricultural production, food security and livelihoods. This multidisciplinary book presents state-of-the-art reviews of current SI approaches to promote major food crops, challenges and advances made in technology, and the institutional and policy measures necessary to overcome the constraints faced by smallholder farmers. Addressing the UN's Sustainable Development Goal 2, the various chapters based on evidence and experiences of reputed researchers show how these innovations, if properly nurtured and implemented, can make a difference to food and nutrition security outcomes. Case studies from around the world are included, with a particular emphasis on Asia and Sub-Saharan Africa. The focus is not only on scientific aspects such as climate-smart agriculture, agroecology and improving input use efficiency and management, but also on institutional and policy challenges that must be met to increase the net societal benefits of sustainable agricultural intensification. The book is aimed at advanced students and researchers in sustainable agriculture and policy, development practitioners, policy makers and non-governmental and farmer organisations.

The System of Rice Intensification (SRI) involves the adoption of certain changes in

## Where To Download System Of Crop Intensification For Diversified And

management practices for rice cultivation that create a better growing environment for rice crops. The use of intermittent irrigation with alternate wet and dry intervals (AWD) and single transplanting of the younger seedlings in wider spacing areas are regarded as the key factors in SRI for better crop growth and productivity. Field experiments were conducted in Chiba, Japan during the two consecutive rice growing seasons (May-September) of 2008-09 to observe the effects of SRI components on rice crop performance, field environment, water savings, and water-wise rice production. The effects of the irrigation method, age of seedlings and spacing were evaluated in the 2008 rice season with eight treatment combinations in a split-split plot design (S-SPD). AWDI at 10 day intervals and continuous flooding throughout the cropping season were the two main plot factors while the effects of seedling age (14 and 21 days) and plant spacing (30x30 cm<sup>2</sup> and 30x18 cm<sup>2</sup>) were evaluated as sub and sub-sub plot factors, respectively. The experimental results revealed that the SRI management with the proposed AWDI can save a significant amount of irrigation water (29%) without reduced grain yield (7.41t/ha compared with 7.37t/ha from normal planting with ordinary water management). Water productivity was also observed to be significantly higher in all combinations of practices in AWDI plots: 1.74 g/liter with SRI management and AWDI as compared to 1.23 g/liter in normal planting with ordinary water management. In addition, the research outcomes showed a role of AWDI in minimizing pest and disease incidence, shortening the rice crop cycle and also improving the plant stand until

## Where To Download System Of Crop Intensification For Diversified And

harvest. Synergistic effects of younger seedlings and wider spacing were seen in tillering ability, panicle length and a number of filled grains that ultimately led to higher productivity with better grain quality. Field experiments with the complete sets of SRI practices were carried out in Randomized Complete Block Design (RCBD) during the 2009 rice growing season in the same field. SRI (with 8 day old seedlings) and conventional (with 22 day old seedlings) practices were the first factor (cultivation method), while organic and inorganic managements were evaluated as the second factor (management method) in the field experiments. The highest yield was observed through the conventional method with inorganic management (6.84t/h) that was on par with the organic SRI (6.59t/h) followed by organic conventional (6.48t/h). It was recorded as 5.92t/h in inorganic SRI management. Overall, the effects of SRI components were positive and significant on a per plant basis; however, they did not differ significantly in terms of grain yield per unit area. The development of healthy and vigorous roots, increased stem diameter, greater productive leaf area, longer panicles, greater number of filled grains, development of plants tolerant to insect-pest and disease, and reduced plant lodging percentage were some notable achievements with SRI management. Water savings and water-wise rice production are other important issues that are likely to draw the attention of rice researchers and farm communities to adopt SRI under scarce water conditions. However, comparatively better grain yields with conventional management methods underscore a need for further investigations in

## Where To Download System Of Crop Intensification For Diversified And

defining an appropriate combination of practices for SRI management, considering local soil properties, prevailing climate and critical watering stages in rice crop management. System of Rice Intensification (SRI) is a popular practice being adopted worldwide to reap rich harvest. In the recent past, the successful SRI practices are being inculcated to other crops in the name of System of Crop Intensification (SCI). The SCI practices also proved to increase the yield levels more than two times. In pursuit of extending the beneficial effect of SRI to SCI in finger millet, the present study was programmed. Finger millet is an important small millet crop ranked third in India in area and production; staple food crop in hilly regions, grown for grain and fodder and cultivated up to an elevation of 3000 metre. By virtue of its superior nutritional quality and dietary fiber, finger millet provides nutritional security to resource-poor farmers. Germinating grains can be malted and fed to infants also. Adoption of SCI practices may enhance the productivity and in turn possible to increase farm income and nutritional security. Global agriculture is now at the crossroads. The Green Revolution of the last century is losing momentum. Rates of growth in food production are now declining, with land and water resources becoming scarcer, while world population continues to grow. We need to continue to identify and share the knowledge that will support successful and sustainable agriculture systems. These depend crucially on soil. Gaining international attention, Dr. Uphoff's efforts to promote and develop sustainable agriculture was recently featured in the N.Y. Times Led by Norman Uphoff, internationally renowned for

## Where To Download System Of Crop Intensification For Diversified And

his proactive approach to world hunger, this volume brings together 102 experts representing 28 nations and multiple disciplines to report on achievements in sustainable soil-system management. While accepting some continuing role for chemical and other external inputs, this book presents ways in which crops can be produced cost effectively in greater abundance with lessened dependence on the exogenous resources that have driven the expansion of agriculture in the past. Including the work of both researchers and practitioners, this important volume —

- Explores soil systems in a variety of climate conditions
- Discusses the importance of symbiotic relationships between plants and soil organisms, looking at crops as integral and interdependent participants in ecosystems
- Seeks to reduce the distance between scientific research and technical practice
- Examines related considerations such as pest and disease control, climate change, fertility restoration, and uses of monitoring and modeling

With 50 self-contained chapters, this work provides researchers, practitioners, and policy makers with a comprehensive understanding of the science and steps needed to utilize soil systems for the long-term benefit of humankind. For information on the SRI, System of Rice Intensification being developed by Uphoff and others, go to <http://ciifad.cornell.edu/sri/>

[Copyright: d50e3cc3fee28968efaa807b6c0ba816](http://ciifad.cornell.edu/sri/)