The Push Pull Farming System | cd6e1b9adbf730665166906137fcd190


What Works in Conservation has been created to provide practitioners with answers to these and many other questions about practical conservation. This book provides an assessment of the effectiveness of 1389 conservation interventions based on summarized scientific evidence. The 2019 edition contains new material on bat conservation. Other chapters cover practical global conservation of primates, peatlands, shrublands and heathlands, management of captive animals as well as an extended chapter on control of freshwater invasive species, the global conservation of amphibians, bats, birds and forests, conservation of European farmland biodiversity and some aspects of enhancing natural pest control, enhancing soil fertility and control of freshwater invasive species. It contains key results from the summarized evidence for each conservation intervention and an assessment of the effectiveness of each by international expert panels. The accompanying website www.conservationevidence.com describes each of the studies individually, and provides full references. This is the fourth edition of What Works in Conservation, which is revised on an annual basis.

Edible insects have always been a part of human diets, but in some societies there remains a degree of disdain and disgust for their consumption. Insects offer a significant opportunity to merge traditional knowledge and modern science to improve human food security worldwide. This publication describes the contribution of insects to food security and examines future prospects for raising insects at a commercial scale to improve food and feed production, diversity diets, and support livelihoods in both developing and developed countries. Edible insects are a promising alternative to the conventional production of meat, either for direct human consumption or for indirect use as feedstock. This publication will boost awareness of the many valuable roles that insects play in sustaining nature and human life, and it will stimulate debate on the expansion of the use of insects as food and feed.

This text brings together fundamental information on insect taxa, morphology, ecology, behavior, physiology, and genetics. Close relatives of insects, such as spiders and mites, are included.

“Old MacDonald had a farm, E-I-E-I-O!” Spin, slide, and pull the tabs to bring this barnyard nursery rhyme to life! It’s a fun day on the farm with Old MacDonald! Sing the nursery rhyme while pulling and sliding the tabs and spinning the wheels! Hop on the tractor, help playful pigs splash in the mud, see ducks waddle across the grass, watch the cows eat their breakfast, and more. Children will love using the hands-on elements while bouncing along with Old MacDonald and his adorable farmyard animals!

Tillage agriculture has led to widespread soil and ecosystem degradation globally. This is especially so in Africa where traditional and modern tillage-based agricultural practices have become unsustainable due to severe disturbance and exploitation of resources and environmental degradation. In contrast, no-till conservation agriculture in Africa today faces major challenges including increased costs of production and energy, the effects of climate change, and the lack of an effective paradigm for sustainable intensification, especially for small- and medium-scale holdings. Africa is facing a serious challenge to food security and as a continent has not advanced towards eradicating hunger. In addition, the population is still growing much faster than on most other continents. This pressure has led to the emergence of no-till conservation agriculture as a serious alternative sustainable agriculture paradigm. In Africa, in recent years, conservation agriculture techniques and methods have spread to many countries, as greater development, education and research effort are directed towards its extension and uptake. This book is aimed at agricultural researchers and scientists, educationalists, and agricultural service providers, institutional leaders and policy makers working in the fields of sustainable agriculture and international development, and also at agroecologists, conservation scientists, and those working on ecosystem services.

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 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.

The book begins by establishing an economic framework upon which to apply the principles of IPM. Then, it looks at the entomological roles of insect species, analyses conceptual, biological, sociological, cultural, and genetic control tactics as well as host plant resistance and the cost of sampling. Lastly it evaluates whether the control provided by a traditional IPM system is sufficient, or if changes to the system design would yield greater benefits.

Is reduced tillage in arable fields beneficial for farmland biodiversity? Is prescribed burning in grasslands beneficial for bird conservation? Does livestock exclusion from degraded peatlands benefit peatland conservation? Is the provision of artificial shelters effective for subtidal benthic invertebrate conservation? Do wind turbine modifications reduce bat fatalities? Does adding topsoil increase the abundance of heathland plants? Are interventions to reduce road impacts on amphibians effective? Do herbicides control invasive parrot’s feather? What Works in Conservation has been created to provide practitioners with answers to these and many other questions about practical conservation. This book provides an
assessment of the effectiveness of conservation interventions based on summarized scientific evidence. The 2020 edition contains new material on mammals, birds, marine benthic invertebrates, bat conservation and wetlands. Other chapters cover topics including conservation of primates, peatlands, shrublands and heathlands, management of captive animals as well as an extended chapter on control of freshwater invasive species, the global conservation of amphibians, bats, birds and forests, conservation of European farmland biodiversity and some aspects of enhancing natural pest control, enhancing soil fertility and control of freshwater invasive species. It contains key results from the summarized evidence for all mammal species categories. Other chapters cover practical global conservation of primates, amphibians, bats, birds, forests, peatlands, subtidal benthic invertebrates, shrublands and heathlands, as well as the conservation of genetic resources within particular sectors of food and agriculture. It is essential to the structure, functions and processes of these systems, to livelihoods and food security, and to the supply of a wide range of ecosystem services. It has been managed or influenced by farmers, livestock keepers, forest dwellers, fish farmers and fisherfolk for hundreds of generations. Prepared through a participatory, country-driven process, the report draws on information from 91 country reports to provide a description of the roles and importance of biodiversity for food and agriculture, the drivers of change affecting it and its current status and trends. It describes the state of efforts to promote the sustainable use and conservation of biodiversity for food and agriculture, including through the development of supporting policies, legal frameworks, institutions and capacities. It concludes with a discussion of needs and challenges in the future management of biodiversity for food and agriculture. The report complements other global assessments prepared under the auspices of the Commission on Genetic Resources for Food and Agriculture, which have focused on the state of genetic resources within particular sectors of food and agriculture.

The State of the World’s Biodiversity for Food and Agriculture presents the first global assessment of biodiversity for food and agriculture worldwide. Biodiversity for food and agriculture is the diversity of plants, animals and micro-organisms at genetic, species and ecosystem levels, present in and around crop, livestock, forest and aquatic production systems. It is essential to the structure, functions and processes of these systems, to livelihoods and food security, and to the supply of a wide range of ecosystem services. It has been managed or influenced by farmers, livestock keepers, forest dwellers, fish farmers and fisherfolk for hundreds of generations. Prepared through a participatory, country-driven process, the report draws on information from 91 country reports to provide a description of the roles and importance of biodiversity for food and agriculture, the drivers of change affecting it and its current status and trends. It describes the state of efforts to promote the sustainable use and conservation of biodiversity for food and agriculture, including through the development of supporting policies, legal frameworks, institutions and capacities. It concludes with a discussion of needs and challenges in the future management of biodiversity for food and agriculture. The report complements other global assessments prepared under the auspices of the Commission on Genetic Resources for Food and Agriculture, which have focused on the state of genetic resources within particular sectors of food and agriculture.

The push-pull farming system has been developed by Uphoff and others, go to http://ciifad.cornell.edu/sri/ to utilize soil systems for the long-term benefit of humankind. For information on the SRI, System of Rice Intensification researchers, practitioners, and policy makers with a comprehensive understanding of the science and steps needed to change, fertility restoration, and uses of monitoring and modeling. With 50 self-contained chapters, this work provides 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 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 scientific research and technical practice. 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Volume 3 of this series of the Handbooks in Economics follows on from the previous two volumes by focusing on the fundamental concepts of agricultural economics. The first part of the volume examines the developments in human resources and technology mastery. The second part follows on by considering the processes and impact of innovation and innovation in this field. The effects of market forces are examined in the third part, and the volume concludes by analysing the impacts of policies on the economics of effects of climate change. Overall this volume forms a comprehensive and accessible survey of the field of agricultural economics and is recommended reading for anyone with an interest, either academic or professional, in this area. *Part of the renown Handbooks in Economics series *Contributors are leaders of their areas *International in scope and comprehensive in coverage

Ecological engineering is about manipulating farm habitats, making them less favourable for pests and more attractive to beneficial and helpful species, and using the resulting natural pest control. Though they found that this was possible in some cases, they also found that it could be far more difficult than initially expected. To be effective, their approach had to be safer and more sustainable than their controversial cousin, genetic engineering. This book brings together contributions from international workers leading the fast moving field of habitat manipulation, reviewing the field and paving the way towards the development and application of new pest management approaches. Chapters explore the frontiers of ecological engineering methods including molecular approaches, high tech marking and remote sensing. They also review the theoretical aspects of this field and how ecological engineering may interact with genetic engineering. The technologies presented offer opportunities to reduce crop losses to insects while reducing the use of pesticides and providing potentially valuable habitat for wildlife conservation. With contributions from the USA, UK, Germany, Switzerland, Australia, New Zealand, Kenya and Israel, this book provides comprehensive coverage of international progress towards sustainable pest management.

Global crop production must substantially increase to meet the needs of a rapidly growing population. This is constrained by the availability of nutrients, water, and land. There is also an urgent need to reduce the negative environmental impacts of crop production. Collectively, these issues represent one of the greatest challenges of the twenty-first century. Sustainable cropping systems based on ecological principles are the core of integrated approaches to solve this critical challenge. This special issue provides an international basis for revealing the underlying mechanisms of sustainable cropping systems to drive agronomic innovations. It includes review and original research articles that report novel scientific findings on improvement in cropping systems related to crop yields and their resistance to biotic and abiotic stressors, resource use efficiency, environmental impact, sustainability, and ecosystem services.

The Encyclopedia of Entomology provides a detailed, global overview of insects and their close relatives, including taxonomy, behavior, ecology, physiology, history, and management. It covers all the major groups of arthropods, as well as many important families and individual species. The encyclopedia also covers physiology, genetics, ecology, behavior, insect relationships with people, medical entomology, and pest management.

An assembly of approximately twenty moth species belonging to the families Crambidae, Pyralidae and Noctuidae constitute the most important cereal pests in many parts of Africa. The caterpillars of these moths bore into the stems of maize, sorghum, millet and rice, often killing the plant, and are commonly known as stem or stalk borers. The cereals attacked are grown on small farms to feed the farmers and their families and are of great importance as the staple food for the population in most parts of Africa. Complex control measures, including the use of chemicals, are often ineffective. This book provides a comprehensive management strategy for these pests, in particular stem borers, in particular strategies using natural enemy components. The book begins by characterizing the economically important species by region and by their biology and host plants. The book then describes in detail the taxonomy and rearing techniques for the moths, their larvae and their natural enemies. It includes illustrated keys of species and lists of distributions and hosts, and it concludes with a summary of current control measures and those being investigated.

Biological invasions are one of the major threats to our native biodiversity. The magnitude of biodiversity losses, land degradation and productivity losses of managed and natural ecosystems due to invasive species is enormous. The ecological and environmental aspects of non-native invasive plants are of great importance to (i) understand ecological principles involved in the management of invasives, (ii) design management strategies, (iii) find effective management solutions for some of the worst invaders, and (iv) frame policies and regulations. The objectives of this book are to discuss (i) ecological approaches needed to design effective management strategies, (ii) recent progress in management methods and tools, (iii) success and failure of management efforts for some of the worst invaders, and (iv) restoration and conservation of invaded land. In an effort to achieve these objectives, contributing authors have strived to provide up-to-date information on the management of non-native invasives. Chapters included in the book are peer-reviewed by international experts working in the area. Readers will get a unique perspective on ecological aspects of the management of invertebrates and control of freshwater invasive species. The book will be useful to graduate students, researchers, managers and policy makers involved in the management of exotic invasives.

The coronavirus pandemic has sparked not only a health crisis but also an economic crisis, which together pose a serious threat to food security, particularly in poorer countries. COVID-19 & Global Food Security brings together a groundbreaking series of IFPRI blog posts looking at the impacts of COVID-19 and the policy responses. IFPRI researchers and guest bloggers provide key insights and analysis on how the global pandemic is affecting global poverty and food security and nutrition, food trade and supply chains, gender, employment, and a variety of policy interventions, as well as reflections on how we can use these lessons to better prepare for future pandemics. These pieces draw on a combination of theoretical arguments, simulation models, in-country surveys, case studies, and expert opinions. Together, they present a comprehensive picture of the current and potential impact of COVID-19 and the world’s policy responses on global food and nutrition security.

Gabe Brown didn’t set out to change the world when he first started working alongside his father-in-law on the family farm in North Dakota. But as a series of weather-related crop disasters put Brown and his wife, Shelly, in desperate financial straits, they started making bold changes to their farm. Brown—on an effort to simply survive—began experimenting with new practices he’d learned about from reading and talking with innovative researchers and ranchers. As he and his family struggled to keep their farm viable on a challenging journey into a new type of farming: regenerative agriculture. Brown dropped the use of most of the herbicides, insecticides, and synthetic
fertilizers that are a standard part of conventional agriculture. He switched to no-till planting, started planting diverse cover crops mixes, and changed his grazing practices. In so doing Brown transformed a degraded farm ecosystem into one full of life—starting with the soil and working his way up, one plant and one animal at a time. In Dirt to Soil Gabe Brown tells the story of that amazing journey and offers a wealth of innovative solutions to our most pressing and complex contemporary agricultural challenge—restoring the soil. The Brown’s Ranch model, developed over twenty years of experimentation and refinement, focuses on regenerating resources by continuously enhancing the living biology in the soil. Through regenerative agriculture, Brown’s Ranch has grown over 100 new species of plants, 100 new species of insects, and 100 new species of birds and animals in only twenty years! The 5,000-acre ranch profitably produces a wide variety of cash crops and cover crops as well as grass-finished beef and lamb, pastured laying hens, broilers, and pastured pork, all marketed directly to consumers. The key is how we think, Brown says. In the industrial agricultural model, all thoughts are focused on killing things. But that mindset was also killing diversity, soil, and profit, Brown realized. Now he channels his creative thinking toward how he can be the gardener on the land—more plants, animals, and beneficial insects. “The greatest roadblock to solving a problem,” Brown says, “is the human mind.”

We rely on chemical cures to keep our bodies free from disease and our farm fields free from bugs and weeds. While human and agricultural health are rarely considered together, both are based on the same ecology, and both are being threatened by organisms that have evolved to resist our antibiotics and pesticides. Fortunately scientists are finding new solutions that work, rather than against, nature. There are viruses that bust apart bacteria; insect pheromones that throw crop destroying moths into a misguided sexual frenzy; plant genes edited to protect against disease; and a resurgence of the ancient practice of facial plantations. In this hopeful book, Monson offers a fascinating look into the future of natural defenses.

Join in the animal fun with this brilliant book full of surprises. With so much to push, pull, turn, and lift, plus fun facts, too, this is the perfect book for children who love animals.

Cover crops slow erosion, improve soil, smother weeds, enhance nutrient and moisture availability, help control many pests and bring a host of other benefits to your farm. At the same time, they can reduce costs, increase profits and even create new sources of income. You’ll reap dividends on your cover crop investments for years, since their benefits accumulate over the long term. This book will help you find which ones are right for you. Captures farmer and other research results from the past ten years. The authors verified the info. from the 2nd ed., added new results and updated farmer profiles and research data, and added 2 chap. Includes maps and charts, detailed narratives about individual cover crop species, and chap. about aspects of cover cropping.

This book contains 20 chapters about the impact, environmental fate, modes of action, efficacy, and non-target effects of insecticides. The chapters are divided into 7 parts. Part 1 covers the non-target effects of insecticides, whereas part 2 is dedicated to integrated methods for pest control, in which insecticides are an important element for diminishing the populations of insect pests. Part 3 includes chapters about the non-chemical alternatives to insecticides, such as metabolic stress and plant extracts. Insecticides and human health are the main topic of part 4, and the interactions between insecticides and environment are discussed in part 5. Part 6 includes the chapters about insecticides against pests of urban areas, forests and farm animals, whereas biotechnology and other advances in pest control are discussed in part 7.

Agriculture in Eastern Europe and Central Asia is diverse, and has great potential to revitalise the economy of the countries in the region via improved productivity (efficiency) and higher total yield for food, fodder and fibre crops. Conservation agriculture can rise to the major challenge of making sustainable intensification of production systems a reality. In order for farmers to transition to appropriate sustainable production systems, the provision of an adequate enabling environment and access to knowledge and services, including extension, mechanisation, inputs and market intelligence, are crucial. This Guide is designed to provide coherent technical tools to Farmer Field Schools and extension service facilitators of conservation agriculture. Furthermore, the Guide is suitable for use within universities’ agriculture curricula.

Little ones can join in the fun! With this bright and colourful board book with gentle rhyming text, beautifully illustrated by the award-winning Axel Scheffler. Also available: Axel Scheffler Pip the Puppy, On the Farm, In the Jungle.

Biodiversity offers great potential for managing insect pests. It provides resistance genes and anti-insect compounds; a huge range of predatory and parasitic natural enemies of pests; and community-level effects of pest control on the local and landscape scales. Chapter 1 describes the impact of insecticides, whereas chapter 2 covers the non-target effects of insecticides, such as metabolic stress and plant extracts. Insecticides and human health are the main topic of part 4, and the interactions between insecticides and environment are discussed in part 5. Part 6 includes the chapters about insecticides against pests of urban areas, forests and farm animals, whereas biotechnology and other advances in pest control are discussed in part 7.

The State of the World’s Land and Water Resources for Food and Agriculture is FAO’s first flagship publication on the global status of land and water resources. It is an ‘advocacy’ report, to be published every three to five years, and targeted at senior level decision makers in agriculture as well as in other sectors. SOLAW is aimed at sensitizing its target audience on the status of land resources at global and regional levels and FAO’s viewpoint on appropriate recommendations for policy formulation. SOLAW focuses on these key dimensions of analysis: (i) quantity, quality of land and water resources, (ii) the rate of use and sustainable management of these resources in the context of relevant socio-economic driving factors and concerns, including food security and poverty, and climate change. This is the first time that a global, baseline status report on land and water resources has been made. It is based on several global spatial databases (e.g. land suitability for agriculture, land use and management, land and water degradation and depletion) for which FAO is the world-recognized data source. Topical and emerging issues on land and water are dealt with in an integrated rather than sectoral manner. The implications of the status and trends are used to advocate remedial
interventions which are tailored to major farming systems within different geographic regions.

Farmers play a crucial role in the preservation and sustainable use of agrobiodiversity. In fact, the diversity of species that support our current agricultural production systems has been carefully managed and shaped by farming communities, over the course of the history of humankind. Farmers act as custodian of the Earth’s agrobiodiversity resources, and play a big part in preserving traditional plant and animal varieties, and the knowledge associated with these. FAO has long been working on promoting approaches to agriculture that enable both the sustainable use of biodiversity resources for food and agriculture, and their conservation, and on supporting farmers to make informed decisions on their farm management and production practices. This training manual fits in this broader commitment, to support a shift towards a paradigm of agricultural production that can sustain food and nutrition security while at the same time cause the least harm to natural ecosystems. The manual is intended as an introduction to agricultural biodiversity, and to its relevance to different aspects of agricultural production and management for smallholder farmers in Kenya. It includes eight different training modules, each covering a specific aspect related to agrobiodiversity. The modules are standalone and can be used independently one from the other, depending on the user’s or project’s aim. The materials were originally prepared within the FAO–Netherlands Partnership Programme (FNPP) and have been updated, revised and published under the second phase of the European Union-funded project “Capacity-building related to multilateral environmental agreements (MEAs) in Africa, Caribbean and Pacific (ACP) countries”.

This volume reviews current developments in integrated pest management (IPM), focussing on insect pests. It discusses advances in understanding species and landscape ecology on which IPM is founded, as well as advances in cultural, physical and biological methods of control. The first part of the book reviews current developments in understanding insect species, community and agroecosystems ecology. This understanding provides the foundation for developing effective IPM programmes which work with ecosystems to keep pests from reaching damaging levels. Parts 2 and 3 then review advances in cultural, physical and, in particular, biological methods of control. Chapters cover developments in classical, conservation and augmentative biological control as well as the use of entomopathogenic fungi, viruses, nematodes and semiochemicals. The final parts of the book summarise current research on monitoring pesticide use as well as emerging classes of biopesticides. Edited by pioneers in IPM techniques, and including contributions from some of most eminent experts in the field, this will be a standard reference for the IPM research community, crop scientists, entomologists, companies involved in pesticides and crop pest management as well as government agencies monitoring and regulating pest management in agriculture.

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.

Part I: low-external-input and sustainable agriculture (leisa): an emerging option; Agriculture and sustainability; Sustainability and farmers: making decisions at the farm level; Technology development by farmers; Part II: Principles and possibilities of leisa; Low-external-input farming and agroecology; Basic ecological principles of leisa; Development of leisa systems; Part III: Linking farmers and scientists in developing leisa technologies; Actors and activities in developing leisa technologies; Participatory technology development in practice: process and methods; Appendices; Appendix A some promising leisa techniques and practices; Appendix B glossary of key terms; Appendix C useful contacts and sources of further information; References; Index.