

Foliar Applied Nitrogen Fertilizers In Spring Wheat Production

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Two areas of interest were identified to investigate how orchard management can improve cider apple orchard management: the influence of nitrogen fertilization on yeast assimilable nitrogen (YAN) concentrations, and when tannins are synthesized in apples and what factors influence their synthesis. Two experiments were carried out using soil and foliar applied nitrogen fertilizers to investigate how nitrogen influences the concentrations and composition of YAN; juice from these experiments were fermented and the production of hydrogen sulfide (H₂S) tracked. Different rates of foliar urea application beginning six weeks before harvest increased YAN by as much as 319% compared to the Control. A high rate of soil applied calcium nitrate fertilizer increased juice primary amino nitrogen (PAN) by 103% relative to the Control. In both fertilizer studies PAN constituted over 90% of YAN. Fertilization increased fermentation rate, but no consistent relationship was found with fertilization rate and H₂S synthesis. There was no influence of nitrogen fertilization on polyphenol concentrations. The increases in YAN demonstrate that nitrogen fertilization is an effective means of increasing juice YAN while not impacting important sensory attributes such as

polyphenols. In order to investigate when polyphenols are produced in cider apples, and the influence of carbohydrate availability, light, temperature, and location within the tree canopy on fruit and juice polyphenol concentrations, five separate experiments were conducted over three years. Analysis of polyphenol concentrations in cortex tissue in developing fruit showed that most polyphenol synthesis occurred in the first five weeks after full bloom (WAFB). Shading whole trees or individual branches in the first five WAFB reduced total polyphenol concentrations by as much 23%. Bagging fruit three WAFB had variable effects on polyphenol concentrations depending on cultivar. Shading branches from four WAFB through harvest resulted in a 16% reduction of polyphenols relative to the Control. Fruit from the tops and exposed lateral sides of tree canopies had lower total polyphenol concentrations in juice than the interior of the canopy. These results suggest that most polyphenols are synthesized early in fruit development and that carbohydrate supply during this period likely influences their development.

Crop Physiology: Case Histories of Major Crops updates the physiology of broad-acre crops with a focus on the genetic, environmental and management drivers of development, capture and efficiency in the use of radiation, water and nutrients, the formation of yield and aspects of quality. These physiological process are presented in a double context of challenges and solutions. The challenges to increase plant-based food, fodder, fiber and energy against the backdrop of population increase, climate

change, dietary choices and declining public funding for research and development in agriculture are unprecedented and urgent. The proximal technological solutions to these challenges are genetic improvement and agronomy. Hence, the premise of the book is that crop physiology is most valuable when it engages meaningfully with breeding and agronomy. With contributions from 92 leading scientists from around the world, each chapter deals with a crop: maize, rice, wheat, barley, sorghum and oat; quinoa; soybean, field pea, chickpea, peanut, common bean, lentil, lupin and faba bean; sunflower and canola; potato, cassava, sugar beet and sugarcane; and cotton. A crop-based approach to crop physiology in a G x E x M context Captures the perspectives of global experts on 22 crops

This book includes twenty-one comprehensive chapters addressing various soil and crop management issues, including modern techniques in enhancing crop production in the era of climate change. There are a few case studies and experimental evidence about these production systems in specific locations. Particular focus is provided on the state-of-the-art of biotechnology, nanotechnology, and precision agriculture, as well as many other recent approaches in ensuring sustainable crop production. This book is useful for undergraduate and graduate students, teachers, and researchers, particularly in the fields of crop science, soil science, and agronomy.

The objective of this study was to investigate the effect of nitrogen fertilizers and plant hormones applied to sweet cherry (*Prunus avium* L.) spurs in early spring on spur leaf

growth and morphological features, including leaf area, leaf thickness and adaxial epidermis cell size. In preliminary studies (2017) with isolated spurs, three plant hormone treatments, gibberellic acid (GA3, 30 ppm), 6-benzylaminopurine (BA, 150 ppm) and 6-benzylaminopurine + gibberellic acid (150 ppm BA + 30 ppm GA4+7) increased total spur leaf area 30%, 37% and 47%, respectively, compared to an untreated control. One nitrogen fertilizer treatment (2.0% calcium nitrate, Ca[NO₃]₂) caused phytotoxicity to emerge spur leaves, and the others (0.5% urea and 1.7% potassium nitrate, KNO₃) showed no significant differences with the control treatment. At the microscopic level, there were no statistically significant differences in leaf thickness among treatments, but the leaf adaxial epidermis cell size was increased from 20% to 40% in the plant hormone treatments, which supports that hypothesis that plant hormones increased leaf size by promoting larger cell size. In follow-up studies at the whole tree level (2018), three experiments examined plant hormone application rates, timing, and gibberellin type. For the Rate experiment, the 150 ppm BA + 30 ppm GA3 and the 75 ppm BA + 15 ppm GA3 applications increased total leaf area per spur by 59% and 55%, respectively. For the Timing experiment, 30 ppm GA3 applied twice (first when three emerging leaves were present and second after accrual of an additional 100 Growing Degree Days, GDD using a base temperature of 7°C) increased total leaf area by 36% relative to the control. For the Gibberellins experiment, 30 ppm GA3 increased total leaf area by 33% relative to the control. However, unlike in

2017 with the isolated spur study, none of the plant hormone treatments to whole trees in 2018 increased the area of individual leaves relative to the control; for the Timing and Rate experiments, the larger total leaf area per spur was due primarily to the emergence of more leaves per spur.

Increasing soybean [*Glycine max* (L.) Merr.] seed yield has been a major objective for producers, and supplementing soybean nodulation with synthetic nitrogen (N) has been suggested as a possible management strategy to maintain or improve yield in environments with high yield potential (>4500 kg ha⁻¹). However, there is limited information available for the use of commercial foliar N products in soybeans in Ohio. The objectives of this research were to (i) examine the effect of foliar and soil applied N on soybean growth and development for several soybean cultivars; and (ii) quantify the seed yield and quality response to various soil and foliar N treatments across soybean cultivars with different maturity groups. Two studies were conducted with six experiments at two Ohio locations across the 2016 and 2017 growing seasons. Soybean growth, nodulation, and maturation rates were evaluated throughout the season, and seed yield and quality were measured after physiological maturity. Data was analyzed using SAS 9.4, and means were separated using Fisher's protected LSD. Single DF contrasts were conducted to compare soybean relative maturity groups across cultivars. Within each experiment (site-year), maturity date, yield, and seed quality varied among cultivars. The maturity group II cultivars produced to have lower

seed protein and matured more quickly than the maturity group III cultivars across site-years and studies. The application of N treatments did not increase maturity date, yield, nor seed quality across all the site-years (experiments), or maturity groups. This research suggested that soil and foliar N at low application rates has minimal effect on soybean growth and development, and may not be an advisable practice for Ohio producers with similar environments as used in these studies.

This time-saving book provides extensive coverage of all important aspects of nitrates in groundwater, ranging from prevention to problem assessment to remediation. It begins by highlighting the nitrogen cycle and related health concerns, providing both background information and a unique perspective on health issues. It then analyzes subsurface pr

The book entitled *Water Quality, Soil and Managing Irrigation of Crops* comprises three sections, specifically: *Reuse Water Quality*, *Soil and Pollution* which comprises five technical chapters, *Managing Irrigation of Crops* with four, and *Examples of Irrigation Systems* three technical chapters, all presented by the respective authors in their own fields of expertise. This text should be of interest to those who are interested in the safe reuse of water for irrigation purposes in terms of effluent quality and quality of urban drainage basins, as well as to those who are involved with research into the problems of soils in relation to pollution and health, infiltration and effects of irrigation and managing irrigation systems including basin type of irrigation, as well as the subsurface

method of irrigation. The many examples are indeed a semblance of real world irrigation practices of general interest to practitioners, more so when the venues of these projects illustrated cover a fair range of climate environments.

Citrus production is complex, requiring a delicate balancing act during the growing season and lots of preparation. This new manual covers the many steps in the process in a clear and accessible way. This manual also details the latest horticultural and disease issues affecting citrus production. From deciding scion variety and rootstock, to establishing an orchard, to managing production, to postharvest handling, you'll find it all here in a readable format. Colorful photos and clear diagrams and illustrations guide you through important concepts. Chapters cover: History Botany and Physiology Orchard Establishment Pest and Disease Management Postharvest Handling

Controlled Release Fertilizers for Sustainable Agriculture provides a comprehensive examination of precision fertilizer applications using the 4-R approach—the right amount of fertilizer at the right time to the right plant at the correct stage of plant growth. This volume consolidates detailed information on each aspect of controlled release fertilizers, including up-to-date literature citations, the current market for controlled release fertilizers and patents. Presenting the tremendous advances in experimental and theoretical studies on sustainable agriculture and related areas, this book provides in-depth insight into state-of-the-art controlled release mechanisms of fertilizers, techniques, and their use in sustainable agriculture. Conventional release mechanisms

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have historically meant waste of fertilizers and the adverse effects of that waste on the environment. Controlled release delivery makes significant strides in enhancing fertilizer benefit to the target plant, while protecting the surrounding environment and increasing sustainability. Presents cutting-edge interdisciplinary insights specifically focused on the controlled release of fertilizers Explores the benefits and challenges of 4-R fertilizer use Includes expertise from leading researchers in the fields of agriculture, polymer science, and nanotechnology working in industry, academics, government, and private research institutions across the globe Presents the tremendous advances in experimental and theoretical studies on sustainable agriculture and related areas Learn how to achieve top yields to maximize profits. This 2011 edition offers the latest information and strategies for alfalfa establishment, production, and harvest. Includes many color photos and charts.

Proceedings of the First International Symposium on Foliar Fertilization, organized by Schering Agrochemical Division, Special Fertilizer Group, Berlin (FRG), March 14-16, 1985

This award-winning publication gives the most in-depth information available on nitrogen fertilization of walnut orchards. Discusses the variables that make nitrogen management of each orchard a unique challenge; and provides the tools that let you manage your orchard efficiently and economically. Chapters discuss concepts of fertilization, nitrogen budgeting, choosing and using nitrogen fertilizers, and fertilizing

young trees.

Excerpt from Effects of Soil and Foliar Applications of Nitrogen Fertilizers on a 20-Year-Old Douglas-Fir Stand We established nine -acre, circular plots in this stand before the 1973 growing season. We located three plots in an area designated for foliar fertilization by helicopter We placed the remaining six in an abutting 14-acre, non - spray area and randomly selected three of these plots for hand fertilization with urea prill; the other three were control plots (fig. Thus, our spray treated plots were adjacent, but not randomly intermingled with the other plots. About the Publisher Forgotten Books publishes hundreds of thousands of rare and classic books. Find more at www.forgottenbooks.com This book is a reproduction of an important historical work. Forgotten Books uses state-of-the-art technology to digitally reconstruct the work, preserving the original format whilst repairing imperfections present in the aged copy. In rare cases, an imperfection in the original, such as a blemish or missing page, may be replicated in our edition. We do, however, repair the vast majority of imperfections successfully; any imperfections that remain are intentionally left to preserve the state of such historical works.

Written in easy-to-read non-technical language, this manual is the perfect field application guide. Inside you'll find the professionalism, expertise and science-based answers you've come to expect from the University of California—with contributions from more than 40 Cooperative Extension professionals, UC faculty, USDA scientists,

and highly skilled prune industry experts.

Chapters include:

An industry overview

A detailed description of prune biology

Information on understanding soils, varieties, irrigation and fertilization

Pest management techniques

A lesson on harvest and postharvest management

The breadth of expertise and knowledge contained in the 320 pages of this manual, along with the more than 300 photos and 56 color illustrations make this one of the most comprehensive prune production manuals in the world.

Cotton production today is not to be undertaken frivolously if one expects to profit by its production. If cotton production is to be sustainable and produced profitably, it is essential to be knowledgeable about the growth and development of the cotton plant and in the adaptation of cultivars to the region as well as the technology available. In addition, those individuals involved in growing cotton should be familiar with the use of management aids to know the most profitable time to irrigate, apply plant growth regulators, herbicides, foliar fertilizers, insecticides, defoliant, etc. The chapters in this book were assembled to provide those dealing with the production of cotton with the

basic knowledge of the physiology of the plant required to manage the cotton crop in a profitable manner.

This bestselling manual is the definitive guide to olive production in California. This 180-page manual is fully illustrated with 40 tables, 19 line drawings, and 36 charts, and 100 color and black and white photos. The most notable additions to this edition include a new chapter on deficit irrigation, a greatly expanded chapter on olive oil production, and coverage of four new pests, including the olive fly. Includes production techniques for commercial growers worldwide - from orchard planning and maintenance to harvesting and postharvest processing. Contains information on pollination, pruning for shaker and vertical rotating comb harvest, mechanical pruning, deficit irrigation, mechanical harvesting methods including trunk-shaking and canopy contact harvesters, postharvest handling and processing methods, and olive oil production. Also includes information on new pests including olive fly, oleander scale, olive mite, and black vine weevil.

This book has been prepared for those seeking a better understanding of the functioning of crop plants, particularly the processes that lead to the generation of products valued by human beings. The contributors, who are among the world's foremost experts on the important crops upon which humanity depends for food or fibre, address the relevant processes for their specific crop. Currently, the world population is continuing to increase. It is projected to plateau around the middle of the next century,

and while there is considerable controversy regarding the population level when this plateau is achieved, most estimates are in the area of 10 000 000 000. At present, there are about 800000000 people in the world who do not have secure access to food. Over the last 50 years various aspects of agricultural research have been combined to increase the output of world crops approximately 2.5-fold. Given the need to feed the increasing population, and to provide better access, it is predicted that during the next 50 years the agricultural research community must repeat this achievement.

This book, *Organic Fertilizers - From Basic Concepts to Applied Outcomes*, is intended to provide an overview of emerging researchable issues related to the use of organic fertilizers that highlight recent research activities in applied organic fertilizers toward a sustainable agriculture and environment. We aimed to compile information from a diversity of sources into a single volume to give some real examples extending the concepts in organic fertilizers that may stimulate new research ideas and trends in the relevant fields.

The Indian Nitrogen Assessment: Sources of Reactive Nitrogen, Environmental and Climate Effects, and Management Options and Policies provides a reference for anyone interested in Reactive N, from researchers and students, to environmental managers. Although the main processes that affect the N cycle are well known, this book is focused on the causes and effects of disruption in the N cycle, specifically in India. The book helps readers gain a precise understanding of the scale of nitrogen

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use, misuse, and release through various agricultural, industrial, vehicular, and other activities, also including discussions on its contribution to the pollution of water and air. Drawing upon the collective work of the Indian Nitrogen Group, this reference book helps solve the challenges associated with providing reliable estimates of nitrogen transfers within different ecosystems, also presenting the next steps that should be taken in the development of balanced, cost-effective, and feasible strategies to reduce the amount of reactive nitrogen. Identifies all significant sources of reactive nitrogen flows and their contribution to the nitrogen-cycle on a national, regional, and global level Covers nitrogen management across sectors, including the environment, food security, energy, and health Provides a single reference on reactive nitrogen in India to help in a number of activities, including the evaluation, analysis, synthesis, documentation, and communications on reactive nitrogen

Conifer Seedling Mineral Nutrition provides a comprehensive review of conifer seedling mineral nutrition and its significance to forestry. The book covers relationships between mineral supply and uptake; the effects of nutrition on seedling growth; an integration of the ideas of T. Ingestad with classical growth analysis concepts; practical aspects of assessing nutrient status and details of fertilizing bare root and container nursery stock; and fertilizing vegetative propagules. The book also describes and illustrates Mycorrhizas, assessing their importance to plantation establishment in an analysis of recent papers reporting field trials. The effects of nutrients on stress resistance and

establishment when applied in the nursery and while planting are discussed in the final chapter. It will prove useful to reforestation research workers, nurserymen, and silviculturalists and should be considered essential reading for forestry students. Proceedings of the International Symposium on Nitrogen Economy in Tropical Soils held January 9-14, 1994 in Trinidad, W.I.

Emphasis in agricultural production has shifted from mere quantity to quality products. Practical experience and scientific investigations have shown that, of the various culture measures, balanced fertilization above all exerts a considerable influence on the quality of agricultural products. Simply adding more of what the crop has already absorbed to capacity is unproductive, expensive, wasteful and damaging to the environment. Therefore, balanced crop nutrition increases crop quality, safeguards natural resources and brings benefit to the farmer. Otherwise rapid population growth and severe urbanization will exhaust our natural resources.

Response of Cool-season Turfgrass to Foliar Applied and Stabilized Nitrogen Fertilizers
Effects of Soil and Foliar Applications of Nitrogen Fertilizers on a 20-year-old Douglas-fir Stand
Controlled Release Fertilizers for Sustainable Agriculture
Academic Press

Agro-Ecosystem Diversity: Impact on Food Security and Environmental Quality presents cutting-edge exploration of developing novel farming systems and introduces landscape ecology to agronomy. It encompasses the broad range of links between

agricultural development and ecological impact and how to limit the potential negative results. Presented in seven sections, each focusing on a specific challenge to sustaining diversity, the book provides insights toward the argument that by re-introducing diversity, it should be possible to maintain a high level of productivity of agro-ecosystems while also maintaining and/or restoring a satisfactory level of environment quality and biodiversity. Demonstrates that diversified agro-ecosystems can be intensified with environmental quality preserved, restored and enhanced Includes analysis of economic constraints leading to specialization of farms and regions and the social locking forces resisting to diversification of agro-ecosystems Presents a global vision of world agriculture and the tradeoff between a necessary increase in food production and restoring environment quality

Soil Fertility Evaluation and Control presents the theoretical background for practical applications of scientific work on soil fertility. The book emphasizes the use of response curves as the basic biological standard for both evaluation and control, and it discusses soil testing and plant analysis as secondary standards. The principal applications covered include fertilizer requirements, fertilizer evaluation, residual effects, fertilizer placement, liming, and economics of fertilization. Environmental aspects of plant nutrients and soil nutrient supplies as they pertain to crop production are also addressed. Most of the information in Soil Fertility Evaluation and Control is drawn from world literature, which makes it a valuable reference for soil scientists, agronomists,

agriculturalists, foresters, and others interested in the evaluation and control of soil fertility.

Sustainable agriculture is a rapidly growing field aiming at producing food and energy in a sustainable way for humans and their children. It is a discipline that addresses current issues: climate change, increasing food and fuel prices, poor-nation starvation, rich-nation obesity, water pollution, soil erosion, fertility loss, pest control and biodiversity depletion. This series gathers review articles that analyze current agricultural issues and knowledge, then proposes alternative solutions.

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