WEED SCIENCE SOCIETY OF NORTH CAROLINA

Emerging Technology in Weed Science
Proceedings of the WSSNC Sixteenth Annual Meeting
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EMERGING APPLICATION TECHNOLOGY. **Thomas C. Mueller and Joyce A. Tredaway, Department of Plant and Soil Sciences, and John B. Wilkerson and William E. Hart, Department of Agricultural and Biosystems Engineering, University of Tennessee, Knoxville, TN.**

ABSTRACT

As a brief overview, the most impactful emerging technology for agriculture in the late 1990's is precision farming. Precision farming involves the use of a global positioning system (GPS) to determine your location in the field, which is necessary to make site-specific recommendations. The decisions, in our case weed control, can be based on historical data such as organic matter or the presence of a certain weed species at a given density. Based on this historical data, a prescription is determined which is then implemented at the location using a variable rate sprayer. This all sounds easy, but determining where you are and then ascertaining the correct answer to a complex biological question, in our case which herbicide to use at what rate, is by no means an easy task.

With the management practices employed by farmers today, yields vary widely between fields and within fields. Some common sources of variability include soil type, soil drainage, pH, fertility levels, organic matter, weed pressures and insect pressures. Because of the variation within the field, every area of a field does not have the same yield potential. However, the common practice has been to treat the entire field uniformly. Applying chemicals based on field averages may result in over-application in some areas while under-applying in other areas. By knowing the weed pressures and soil characteristics within a field, herbicides may be applied on a variable rate basis.

The initial phase of this research established and determined varying weed densities. Corn (DK 689) was planted May 15, 1996 on 14 acres. Early postemergence treatments were applied on June 4, 1996. Treatments for corn included nicosulfuron to control grasses and dicamba to control broadleaves. Weed density maps were generated using GPS and GIS to plan PRE herbicides for 1997 season. On May 12, 1997, corn was planted into a tilled soil bed with 600 pounds of 10-10-10 fertilizer. The experimental design was a randomized complete block with a strip-plot treatment arrangement. There were 112 main plots and 224 sub-plots. Sub-plot size was 24 feet by 90 feet. Plots consisted of conventional and site-specific management. Conventional plots received uniform applications at the 1x rate of all herbicides. Site-specific herbicide application was based

on weeds present and their densities in 1996. Alachlor was applied at 2.5 lb/acre to the entire field due to heavy, uniform broadleaf signalgrass (Brachiaria platyphylla) pressure in all plots. Atrazine (2.0 lb/acre) was applied to all conventional plots and to site-specific plots in areas containing the medium and high pressures of common cocklebur (Xanthium strumarium) in 1996. Areas were deemed medium and high pressures if population was 3-5 and 6-8 plants per yard2, respectively. Conventional PRE applications were made on May 19, 1997. Site-specific PRE applications were made on May 20, 1997. POST applications of dicamba and nicosulfuron were applied on June 23, 1997 to control trumpetcreeper (Campsis radicans), common cocklebur, johnsongrass (Sorghum halepense), and broadleaf signalgrass. The variable application sprayer was equipped to spray 1/3, 2/3, and 1x rates by altering total spray output, therefore spraying 10, 20, and 30 gallons per acre, respectively. Yields were taken with a combine equipped with a yield monitor interfaced with a GPS unit to determine the yield differences in the field and the effect of the weed control system. In 1997, yields were lower in plots receiving site-specific herbicide applications, presumably due to less complete weed control. The economic advantage of lowering herbicide costs was offset by lower income due to decreased corn yield. The weather during 1997 was extremely wet in June, so the timely application of the postemergent herbicides was difficult.

Precision farming at this time is primarily being driven by soil fertility decisions. We have managed fields to encourage fertility differences. A uniform fertilizer application over a field with varying yield levels may result in the highest yielding portion of the field extracting more nutrients than were applied and the lowest yielding portion of the field extracting less nutrients than were applied. The result is that the highest fertility levels are located in those areas of the field with the lowest yields, thus there may be no correlation to a soil fertility test and yield. A consensus is emerging that the primary yield limiting factor is often soil physical properties, such as drainage, water-holding capacity, compaction or soil depth.

The use of precision farming relies on complicated technology, where one error disables the entire system and renders it inoperative. There may often be a discrepancy between what a vendor claims a GPS, software package, or a controller can do and what it actually does, given that compatibility between different units is a challenge. Since the use of precision farming entails a large up-front expense in hardware and software, the utilization of this technology is not "farm size neutral", and smaller farmers would have a higher cost per acre initial investment. In contrast, if a new variety of seed or a new crop protection chemical becomes available, a small farmer can buy a few bags and enjoy their use just as much as a large farmer. Coupling a global positioning system with powerful mapping software can be a powerful management tool. Yet, I urge you to not become enamored with pretty pictures. The true value of the data is in developing predictive capabilities to answer important biological questions that make for more profitable farming while still minimizing environmental impacts.

key words: site-specific, global positioning system, variable rate application

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IMPROVING THE PERFORMANCE OF BIOHERBICIDES. C. Douglas Boyette. USDA-ARS, Southern Weed Science Research Unit, Stoneville, MS 38776.

ABSTRACT

Biological control is the deliberate use of one or more organisms to control an unwanted biological pest. Bioherbicides are organisms (usually fungi or bacteria) which are used to control weeds, and are applied in much the same manner as conventional chemical herbicides. Although bioherbicides may be highly effective in controlling their target weeds, most possess biological constraints which limit their utility. Many of these constraints which limit their practical usage can be overcome or mediated through innovative formulation and application approaches.

For example, aqueous conidial suspensions of Colletotrichum truncatum require from 6-to-8 h of free moisture (dew) in order to achieve optimum pathogenesis and mortality of hemp sesbania (Sesbania exaltata). However, when conidia are formulated either in an invert emulsion or in crop oil emulsions, the dew requirements are reduced to less than 1 h, and weeds can be controlled 90-to-95% under field conditions. An anthracnose-forming pathogen of coffee senna (Cassia occidentalis) is also weakly virulent against sicklepod (C obtusifolia), a much more widespread and problematic weed in the southeastern U.S. When conidia are formulated with unrefined corn oil and the surfactant Silwet L-77, over 90% control of emerging sicklepod can be achieved in soybean field test plots. Similarly, Alternatia helianthi requires a lengthy dew period (> 12h) to effectively control common cocklebur (Xanthium strumarium). However, the dew requirements are reduced to less than 6 h when conidia were formulated in 0.10% Silwet L-77 and unrefined corn oil, and cocklebur was effectively controlled in field trials using this formulation.

As ecological concerns continue to threaten the usage of many chemical herbicides, ecophilic alternatives such as bioherbicides may assume an increasingly important role in weed management practices. However, research should perhaps focus more upon developing and improving formulation and delivery systems for bioherbicides, which will require closer cooperation among plant pathologists, weed scientists, formulation chemists, fermentation scientists, and agricultural engineers for the continued evolution of bioherbicides.

PRECISION AGRICULTURE AND CROP PROTECTION CHEMICALS. R. L. Brooks. Novartis Crop Protection, Greensboro, NC.

ABSTRACT

Precision agriculture is the management of all agricultural information using mapping technology to a.)develop a strategy to maximize profits by applying inputs where the most economical gain will occur; b.) benefit society to demonstrate sound environmental practices; and c.) preserve crop identity by providing a pedigree of the information for public consumption throughout the food and fiber industries.

Precision agriculture is a relatively new concept to agriculture, which became prominent about 1995. Technology transfer came from the defense industry and was driven by equipment manufacturers. After a few years of development by the innovators and early adopters in the agricultural industry, precision agriculture is on the beginnings of being more widely adopted. Adoption of precision agriculture will continue to gain acceptance as the equipment and technology improves in its capabilities and reliability. The benefits from precision agriculture are still being developed along with the technologies. These

benefits will be realized wherever growers see the most potential in their farming operations, and will differ depending on growers' perceptions and experiences.

Precision agriculture allows a holistic systems analysis of agriculture, thereby challenging traditional research methods. Many companies and research institutions are well-equipped to perform small-plot research to extrapolate to the real world experiences of producers. Precision agriculture technologies provide new tools to perform systems analysis and on-farm demonstration research. These technologies will change the way agricultural products are used and selected, challenging the way product recommendations are developed today.

Crop protection chemicals will need to be developed with better recommendations which fit into these new technologies. This will require integration with producers' site-specific agronomic and environmental conditions. Future product recommendations will need to fit into best practices based on sound agronomic and environmental principles. These technologies will allow an improvement in overall quality and management of pesticide applications.

INFLUENCE OF MOISTURE STRESS AND TEMPERATURE ON SICKLEPOD GERMINATION. **A. W. Burleson, J. W. Wilcut, B. Keyes, S. D. Askew, and W, A. Bailey. Crop Science Department, North Carolina State University, Raleigh, NC 27695-7620.**

ABSTRACT

Sicklepod seed were collected near Goldsboro, NC in 1996 and were stored in a paper bag at approximately 25 C for one yr before use in laboratory germination and emergence experiments. Imbibition and germination of sicklepod seed were evaluated in a factorial arrangement of osmotic potentials and diurnal temperature regimes. The osmotic potentials in Experiment I were 0, -200, -600, -1000, and -1400 kPa while in Experiment II, the osmotic potentials were 0, -200, -400, -600, and -800 kPa. Osmotic solutions were established by dissolving polyethylene glycol 8000 MW (PEG 8000) in distilled water. The diurnal temperature regimes were 40/18, 36/15, 32/12, 28/9, 23/7. 19/4, and 15/2 C on a 12 h high temperature and 12 h low temperature regime. The diurnal temperature regimes were maintained in a computer-controlled water bath. The petri dishes 4.5 cm in diameter and containing three filter papers (Whatman No. 1) were wetted with 5 ml of the appropriate osmotic solution. Fifty sicklepod seed were placed in the petri dishes and germination was recorded for a 6 d and 7 d period, in Experiments I and 11, respectively. As sicklepod seed germinated (radical extension of at least 2 mm), they were removed from the petri dish. Appropriate osmotic solution was added to the petri dishes on an as needed basis. Data were subjected to ANOVA and regression analyses was performed.

In experiment 1, cumulative germination was highest at 0 and -200 kPa at the four highest temperature regimes. Germination was approximately 12 to 16% for these environmental conditions, When averaged over temperatures, it was readily apparent that sicklepod germination decreased linearly with decreasing osmotic potential. For example, at 0 kPa germination was approximately 13.5% and decreased to 7% at -320 kPa and 4% at -480 kPa. The equation [y = 13.56 + 0.0197 (x)] (r2=0.67) was developed to predict sicklepod germination as influenced by osmotic potential. When averaged across water regimes, the equation [y = 1. 171 + 3.954 (x) + 0.56 (X2)] (r2=0.80) was developed to predict

sicklepod germination. Germination peaked at approximately 8% for the diurnal temperature regimes of 28/9 C and 23/9 C.

In Experiment II, sicklepod germination peaked when temperature regimes ranged from 21 to 36 C and with osmotic potentials of 0 to -200 kPa. A similar trend was noted in Experiment I. As seen in Experiment I, germination dropped off quickly when osmotic potentials were less than -200 kPa or when temperatures were too low. Germination for treatments that had fairly high temperatures and little water stress occurred within 1 to 3 days (data not shown). As temperatures and osmotic potentials decreased, germination took a longer period of time. When averaged over temperatures, sicklepod germination decreased linearly with decreasing osmotic potential as expressed in the equation [y = 18.61 + 0.025(x)] (r 2 = 0.92). This equation is similar to the one developed from Experiment I. Examining seed germination averaged over osmotic potentials, the equation [y=56.88 + 40.57(x) + -7.59(x2)] (r2=0.67) predicts the response of sicklepod germination. As seen in Experiment I, germination peaked for temperature regimes that ranged from 36/15 to 28/9 C.

IMPACT OF MOWING ON GROWTH AND REPRODUCTIVE CAPACITY OF YELLOW NUTSEDGE (Cyperus esculentus). J. R. Summerlin, Jr., H. D. Coble, and F. H. Yelverton, Crop Science Department, North Carolina State University, Raleigh, NC 27695-7620.

ABSTRACT

Perennial sedges are troublesome, difficult to control weeds in turfgrass in the United States. Yellow nutsedge can be found in many turfgrass settings throughout the southeast. After many years of chemical treatment and repeated mowing, yellow nutsedge populations have continued to be problematic pests for turfgrass managers. High maintenance turfgrass areas such as golf courses, athletic fields, and home lawns have provided excellent habitats for sedge populations. The frequent mowing that is common in these areas has not appeared to dramatically reduce the densities of these problematic sedges.

Field experiments were conducted to evaluate the responses of yellow nutsedge to mowing at heights and frequencies common to golf course fairway and rough areas. Research trials were located at the Sandhills Research Station near Jackson Springs, NC during the 1996 and 1997 summer turfgrass seasons and were established on bare ground. Yellow nutsedge tubers were purchased from Azlin seed company of Leland, Mississippi.

Mowing heights and frequencies were selected to be consistent with those of bermudagrass fairway (1.3 cm, three times per week) and rough areas (3.8 cm, once per week). A non-mowed check was included for comparison purposes. Plots were arranged in a split-plot experimental design with four replications. Shoot number and plant spread were evaluated at regular intervals during the growing season. At the end of each season, plants were excavated and further evaluations were conducted. Yellow nutsedge was further evaluated for the number of tubers produced by each plant and tuber size. Appropriate ANOVA comparisons were made to test for differences in the overall growth curves for shoot number and plant spread. Measurements and counts of excavated plant material were subjected to ANOVA analysis and separated by Fisher's protected LSD at the 0.05 level of significance.

Shoot removal via mowing reduced yellow nutsedge shoot number and plant spread in 1996. More profound but statistically similar results were found in 1997. In both years, shoot number at the point of maximum vegetation was reduced by 93% for the 1.3 cm mowing treatment and by more than 75% for the 3.8 cm treatment. Likewise, plant spread was reduced by more than 77 and 60% for the two respective treatments. No tubers were found on plants subjected to the two mowing treatments in either year. The non-mowed check produced means of 27 and 451 tubers in 1996 and 1997, respectively.

ITALIAN RYEGRASS (Lolium multiflorum Lam.) RESPONSE TO RESIDUAL PHOSPHORUS LEVELS IN WINTER WHEAT. T. M. Perez-Femandez* and H.D. Coble, North Carolina State University, Raleigh.

ABSTRACT

A field study was conducted to evaluate the influence of residual levels of soil phosphorus (P) on Italian ryegrass plants growing naturally in winter wheat. The study was performed from December 1996 to June 1997 at the Tidewater Research Station, Plymouth, NC in a field previously used for long-term studies in determining yield responses to soil P. The experimental design was a randomized complete block with 6 blocks and 20 plots per block. There was a total of 120 plots with 46 different values of Mehlich-3 extractable P residual levels ranging from 13 to 78 mg/dM3 . From three ryegrass plants per plot, plant height and tiller number were collected on six different dates. Number of individuals per m2 (density) was determined on three different dates. Seedheads per m2 were determined near harvest time.

The sustained increases in plant height, tiller number, density, and seedheads/m2 until P levels of 40 mg/dm3 and 55 mg/dm3, respectively, suggested a positive trend of Italian ryegrass growth as soil residual P levels increased. Above these levels those dependent variables fluctuated greatly, which may be attributed to effects of wheat-ryegrass interactions. Wheat-ryegrass interactions affected ryegrass response as wheat plants present greater competitive advantages due to size of seeds and seedlings, the greater density of wheat compared to that of ryegrass growing in this population, and the vigorous growth of wheat plants at higher residual P levels.

Regressions, linear and quadratic, of mean height per plant and seedheads/m2 on residual phosphorus were significant for all dates of measurement. Regressions, linear and quadratic, of mean number of tillers per plant and density were only significant for dates 2, 3, and 4. Although the correlation coefficients (r2) were not higher than 0.63 under these field conditions, Italian ryegrass growth appeared to respond to soil residual P. The most significant effect was illustrated with plant height.

VELVETLEAF INTERFERENCE AND SEED-RAIN DYNAMICS IN COTTON. W. A. Bailey, S. D. Askew, and J. W. Wilcut, North Carolina State University, Raleigh.

ABSTRACT

Velvetleaf is considered one of the most important weeds in U.S. corn production and is also very competitive in other crops. Velvetleaf has become a very invasive and competitive weed in cotton due to factors such as seed dormancy, ability to emerge from deep within the soil, and limited control measures. Velvetleaf seeds exhibit a high degree of dormancy that makes eradication nearly impossible with normal agricultural practices. We feel that velvetleaf is more competitive in North Carolina than in other regions due to climatic conditions that are more conducive to rapid velvetleaf growth. While much research has been conducted with velvetleaf in corn and soybeans, only limited research has been conducted with velvetleaf in cotton. Additionally, the seed production of economic and sub-economic threshold populations is a concern and there is no published data on this area.

Interference is the result of interactions among species in mixtures that lead to reduced growth or increased mortality in one or both species. Several reports have suggested that velvetleaf interference may be due to allelopathy. Decreased light from mutual shading of leaves in a mixed crop and weed canopy or from leaves positioned above adjacent plants reduces both photosynthetic and growth rates. The degree of competitive damage to cotton caused by a weed population is a function of density, duration and species composition. In general, cotton must be kept weed-free for 4 to 8 weeks after emergence in order to avoid yield loss. Greenhouse research has documented that cotton and velvetleaf have equivalent interference capabilities in the first 5 weeks after emergence when growing together.

Under ideal conditions, velvetleaf uses significantly more water than cotton. Yield and harvesting-efficiency reductions can be attributed to velvetleaf in a number of crops. In cotton, yield reductions of 2.7% were reported per velvetleaf plant in 10 m of row. Under optimum conditions, one self-fertilizing plant can produce up to 17,000 seed for subsequent infestation. The objectives of this study were: 1) to evaluate velvetleaf for competition and interference characteristics in conventional tillage cotton in North Carolina, and 2) to determine seed production and seed-rain dynamics of velvetleaf when planted at different densities in cotton.

This experiment was conducted in 1997 in Clayton, NC. Cotton variety was BXN 47. Plot size was 3.66 x 9.14 m (4 rows). Study design was randomized complete block with 3 replications. Velvetleaf seedlings were planted into plots immediately after cotton planting at the following densities: 0, 0.1, 0.2, 0.4, 0.8, 1.2, 1.6, and 3.2 plants per meter of row. Velvetleaf seedlings were planted into the center two rows of each plot with the two outer rows left as untreated checks for each plot. All plots were kept weed free except for velvetleaf. All velvetleaf seed were harvested as pods matured. One velvetleaf plant from each plot was mapped throughout the season to determine the node and position of each mature pod. Height measurements for cotton and velvetleaf were taken weekly until six weeks after planting and bi-weekly for the remainder of the season. Data were subjected to analysis of variance, least significant difference at 0.05 level of significance, and regression analysis where appropriate.

Velvetleaf canopied over the cotton at three weeks after planting. This data illustrated that obtaining an adequate height differential for post-directing is difficult for velvetleaf in cotton. The new registrations of Buctril for BXN cotton, Roundup Ultra for Roundup Ready cotton, and Staple for all cotton varieties will be valuable POST options for velvetleaf management in cotton. Cotton lint yield showed an inverse relationship with increasing velvetleaf density. Cotton yield was unaffected at velvetleaf densities up to 0.4 plants/m2. Yield decreased dramatically at the lower densities. The quadratic equation [y

= 1259 - 323x + 33.7x2] (r2 = 0.87) illustrates the relationship of cotton lint loss to velvetleaf density. This data illustrates that velvetleaf is more competitive with cotton in North Carolina than what has been reported in more southern geographic locations. As a consequence, North Carolina producers may have different economic thresholds. Additionally, this data shows that the prolific seed rain dynamics of velvetleaf needs to be carefully assessed when determining action thresholds. Czapar et al. reported that 38, 55, and 42% of the producers, agricultural chemical dealers, and farm managers/appraisers who were surveyed, respectively, were concerned about seed rain dynamics when using economic thresholds. Our data supports these concerns.

Future research plans include evaluating effect of velvetleaf density and node on seed germination. Also, repeating the current study will test results in differing environmental conditions.

APPLICATION AND EFFICACY UPDATE WITH THE BURCH WET BLADE®. **W. A. Skroch. Burch Company, PO Box 1046 North Wilkesboro, N.C. 28659**

ABSTRACT

The Burch Wet Blades is an integral part of a new vegetation management system. It allows selective application of various fluids such as pesticides, growth regulators, biorationals and fertilizers to vegetation in minute amounts which is immediately absorbed by the plants vascular system as it is cut.

The system utilizes a specially designed blade that is connected to a closed liquid distribution system consisting of prepackaged, stackable, returnable containers connected directly to the mower blade. The Burch Wet Blades is a non-spray, enclosed system that provides precise pesticide application thereby reducing the quantity of chemical needed, eliminating worker exposure and drift. Currently Burch Company has developed several models of equipment suitable for use in cutting grass, weeds, brush and trees up to four inch in diameter.

Research results showing control of a range of herbaceous and woody plants has been very good. In most cases control equal to the normal spray rate for said chemical can be reduced up to 50% without any loss of efficacy.

In 1998 Burch Company introduced a 90 inch Wet Blades mower which can be either front or rear mounted. This system includes the Dickey-john Land Manager precision application control system. This system allows for an accurate application of vegetation control products by maintaining the application rate regardless of your ground speed. A RS232 port is standard on all units and provides for a GPS interface which allows precision mapping and record keeping of the treated areas.

THE BEAT GOES ON: "CYANAMID LAUNCHES TWO NEW HERBICIDES". **Tom Hunt. American Cyanamid, 8504 Burnside Drive, Apex, NC 27502.**

ABSTRACT

RAPTOR® a new post applied herbicide has three distinct attributes, residual control, activity on most broadleaf and grass weeds and rotational crop safety for major southern crops. These qualities make it truly unique in the marketplace. The common name for RAPTOR is Imazamox, and is currently labeled for soybeans as an early post application. It is formulated as a 1 lb. per gallon aqueous solution.

Apply RAPTOR herbicide at 4 fluid ounces per acre E.Po. when preceded by a full rate of a registered soil applied grass herbicide like PROWL 3.3 EC herbicide.

OR
Apply RAPTOR at 5 fluid ounces per acre E. Po. in a total postemergence herbicide program.

OR
Apply 4-5 fluid ounces plus Roundup 1 pt. E. Po. An adjuvant (either a surfactant or a crop oil concentrate) and a nitrogen fertilizer must be added to the spray solution for optimum weed control activity. See the ADJU'@TANT section under MIXING INSTRUCTIONS for specific instructions. When RAPTOR is applied postemergence, absorption will occur through both the roots and foliage. Susceptible weeds stop growing and either die or are not competitive with the crop. RAPTOR not only controls many existing broadleaf and grass weeds when applied postemergence, it also provides activity on susceptible weeds that may emerge shortly after application.

Three years of evaluations in N.C.S.U., VPI and Cyanamid field plots identified RAPTOR's strengths in controlling broadleaf signal grass, lambsquarter, cocklebur, nightshade sp. and pigweed sp. to name a few in our area.

The following rotational crops may be planted after applying up to 5 fluid ounces per acre of RAPTOR herbicide in soybeans

1. Anytime - Soybeans

2. Three months Wheat

3. Four months Barley, rye

4. Nine months Alfalfa, Broccoli, Cabbage, Cantaloupe, Carrot, Corn (field, pop, seed, sweet), Cotton, Cucumber, Edible Beans, Grain Sorghum, Oat, Onion, Pea, Peanut, Pepper, Potato, Pumpkin, Rice, Squash, Sunflower, Tobacco, Tomato, Turnip, and Watermelon.

For tank mix options, precautions and other information consult the label.

LIGHTNING® - This new product is formulated as a 70% dispersible granule with a use rate of 1.28 oz. per acre. LIGHTNING is composed of 52.5% imazethapyr and 17.5% imazapyr. At the 1.28 oz. rate per acre that is 0.042 lb. ai./acre of imazethapyr and 0.014 lb. ai./acre of imazapyr. Although these active ingredients are found in other Cyanamid products, it is the synergistic activity that makes LIGHTNING unique. LIGHTNING offers corn producers contact and residual control of over 50 broadleaf weeds and grasses including broadleaf signalgrass, Johnsongrass, crabgrass, sicklepod, pigweed sp. and morningglory sp. After 8+ years of research and development Cyanamid has optimized the rates of imazapyr and imazethpyr that maximize synergistic weed control and rotational crop flexibility.

Apply LIGHTNING early post at a broadcast rate of 1.28 oz. per acre. one soluble bag of

this product will treat 2.0 acres of IMI - corn.

Apply when majority of weeds are 1-3 inches tall and before corn is 18 inches tall.

Additives include crop oil concentrate or methylated seed oil (such as Sun-It II at 1 gallon/100 gallons of spray mixture or non-ionic surfactant at 1 qt./100 gallons of spray mixture and Liquid Fertilizer at 1-2 qts./A or ammonium sulfate at 2.5 lbs./A.

New IMI - corn varieties come to the market each year. For example Pioneer, Southern States, Dekalb, and other companies have new IMI varieties adapted for southern conditions, with southern corn leaf blight resistance and stocked genes for maximum insect, disease resistance and yield. See seed company literature for your specific needs.

The following rotational crops may be planted after applying 1.28 oz./acre of LIGHTNING herbicide in IMI corn:

1. Four months Rye, wheat

2. Eight and one-half months Field corn - any variety

3. Nine and one-half months Alfalfa, barley, edible beans and peas, peanuts, tobacco and cotton.

4. For other crops see label

For tank mix options, precautions and more details consult the label.

INDUSTRY UPDATE: BASF. **Tom McKemie. BASF Corporation, PO Box 13528, Research Triangle Park, NC 27709.**

ABSTRACT

In December of 1996 BASF Corporation purchased the corn herbicide line of Sandoz as the parent companies of both Ciba and Sandoz merged. The purchase included Banvel, Banvel SFG, Clarity, Frontier, Guardsman, Marksman, Op Till, and Weedmaster herbicides. BASF also obtained the Sandoz manufacturing facilities in Beaumont Texas where dicamba and dimethenamid are produced. BASF also grew in the number of employees, by adding nearly 100 researchers and staff at the main office in Research Triangle Park, N.C. and 200-300 people at the manufacturing site.

The addition of the Sandoz corn herbicide line improves BASF's position in both the corn and soybean market place. These corn products compliments the well established soybean line that includes herbicides well known in North Carolinas such as, Basagran, Blazer, Conclude, Conclude Xtra, Laddok S12, Poast, Poast Plus, and Storm.

In agreement with Norvartis (Ciba and Sandoz), BASF has the rights to Frontier, Guardsman, and Clarity worldwide. While BASF has the rights to the Banvel name, both Norvartis and BASF will share the use of dicamba. BASF will have the North American rights to corn, sorghum, small grains, pasture, hay, rangeland, general farmstead (non-

crop), fallow, sugarcane, asparagus, turf and grass seed crops. BASF also will have preplant burn down or post harvest applications in wheat, corn, sorghum, soybeans, and cotton. All other uses are with Norvartis and vary worldwide.

BASF will have three new products which will be introduced to university cooperators in 1998. BAS 662 OOH or Distinct herbicide. Distinct is a 1:2.5 mixture of diflufenzopyr and the Na-salt of dicamba. Diflufenzopyr is an auxin transport inhibitor. Distinct controls a wide range of broadleaf weeds and symptomology in sensitive annual grasses is characterized by a "herbistatic" stunting effect on growth. Tolerance in corn occurs through rapid metabolism of diflufenzopyr and dicamba. With a favorable review by EPA, Distinct should be sold in 1999.

BAS 620 OOH will have the trade name Equinox. Equinox is a postemergence graminicide and is a cyclohexanone. Equinox will control a wide range of annual and perennial grass weeds in cotton and soybeans. The registration package was submitted in late 1997 with first year sales in 2000.

The new formulation of dimethenamid containing the optically active isomer will be ready for the market in the year 2000. BAS 656 07H or dimethenamid -p will be introduced in 1998 and hopefully first year sales in 1999 or 2000. BAS 656..H will be applied in corn, sorghum, sweet corn, soybeans, and peanuts.

Other new products from BASF include Sovran fungicide for apples, grapes, and almonds with registration expected in 1999 or 2000. Also Cygnus fungicide in greenhouse and ornaments for 1999 or 2000. Baseline and Apogee for growth regulation in peanuts (2000) and apples (2001), respectively.

DUPONT AGPRODUCTS INDUSTRY UPDATE. Susan K. Rick. Dupont Agricultural Products, Walkers Mill, Barley Mill Plaza, PO Box 80038, Wilmington, DE 19880-0038..

ABSTRACT

LABEL CHANGES IN 1998 FOR STAPLE HERBICIDE INCLUDED A PREEMERGENCE LABEL FOR USE OF .8 TO 1.2 OZ PRODUCT ALONE OR WITH METURON. THE RECROPPING OF FIELD CORN FOLLOWING A BROADCAST APPLICATION WAS APPROVED. THE 2EE FOR THE TANK MIX OF MSMA PLUS STAPLE OVER THE TOP WAS RENEWED.

BASIS GOLD CORN HERBICIDE WILL BE SOLD IN NORTH CAROLINA IN 1998. BASIS GOLD IS A BROAD-SPECTRUM POSTEMERGENCE GRASS AND BROADLEAF COMPOUND THAT CONTAINS RIMSULFURON, NICOSULFURON AND ATRAZINE. THE USE RATE WILL BE 14 OZ PRODUCT PER ACRE.

ACCENT GOLD IS A NEW PRE MIX OF DPX-79406 AND HORNET. THE ACTIVE INGREDIENTS INCLUDE NICOSULFURON, RIMSULFURON, CLOPYRALID AND FLUMETSULAM. THE PRODUCT WILL OFFER BROAD-SPECTRUM GRASS AND BROADLEAF CONTROL POSTEMERGENCE IN CORN. THE USE RATE IS 2.9 OZ PRODUCT PER ACRE.

AUTHORITY FIRST CONTAINING SULFENTRAZONE WILL BE SOLD PRE WITH A

FOLLOWUP APPLICATION OF SYNCHRONY OR RELIANCE IN THE MIDWEST. CANOPY XL A PREMIX OF CBLORD,4URON AND SULFUENTRAZONE WILL BE SOLD IN THE SOUTHEAST.

MILESTONE IS THE TRADE NAME FOR DPX-R6447. THE COMMON NAME FOR MILESTONE IS AZAFENIDIN. IT HAS PREEMERGENCE AND POSTEMERGENCE ACTIVITY ON A BROAD SPECTRUM OF GRASS AND BROADLEAF WEEDS. MILESTONE IS BEING TESTED IN CITRUS, SUGARCANE, FRUIT AND NUT CROPS. MILESTONE HAS A NOVEL MODE OF ACTION; IT IS A PORPHYRIN BIOSYNTHESIS INHIBITOR WHICH RESULTS IN CELL MEMBRANE DISRUPTION. MILESTONE HAS A FAVORABLE TOXICOLOGICAL AND ENVIRONMENTAL PROFILE. AT A USE RATE OF 4 TO 16 OZ PER ACRE 4 TO 10 MONTHS RESIDUAL CONTROL IS OBSERVED.

DPX-MX 670 WILL BE SOLD IN 1999. IT IS A PREMIX OF FRONTIER AND ATRAZINE. A TRADE NAME HAS YET TO BE ANNOUNCED. IT WILL BE OFFERED AS A REPLACEMENT FOR CYANAZINE PRODUCTS IN CORN.

CHANGES WITHIN THE COMPANY IN THE PAST YEAR HAVE BEEN NUMEROUS, WE ARE NOW A PART OF THE DUPONT AG ENTERPRISE. THE CPC BUSINESS IS ONE OF SEVERAL COMPONENTS OF THE NEW ENTERPRISE. OTHER BUSINESSES INCLUDE QUALICON A DIAGNOSTICS COMPANY; GRIFFIN A DISTRIBUTION AND COMMODITY PRODUCT PARTNER WHO WILL HANDLE MANZATE, LOROX, KARMEX AND VENDEX; OPTIMUM QUALITY GRAINS A JV WITH PIONEER HIBRED TO DEVELOP CORN AND SOYBEAN VARIETIES WITH IMPROVED TRAITS AS HIGH OIL, AA, ETC; PTI FORMERLY PART OF RALSTON PURINA WILL BE PRODUCING MANY OUTPUT PRODUCTS FROM SOYBEANS, ETC; AND CEREAL DERIVED FUNCTIONAL INGREDIANTS PURCHASED FROM DALGETY OF CAMBRIDGE, ENGLAND WILL BE WORKING ON VALUE ADDED OUTPUT TRAITS FROM CEREAL GRAINS.

MINUTES OF THE ANNUAL BUSINESS MEETING WEED SCIENCE SOCIETY OF NORTH CAROLINA MARCH 10, 1998

- The meeting was called to order at 1:05 P.M. by President David Monks. The meeting was held in the McKimmon Center on the NCSU campus.

- The minutes of the previous annual business meeting held on March 6, 1997 were approved as read.

- The Treasurer's report was given by Secretary-Treasurer Susan Rick. A copy of the report is attached. The report was accepted as read.

- Committee reports:

  1. Legislative committee: Bobby Walls reported that there were two important issues being discussed currently. They included the use of pesticides on utilities and rights-of-way and the FQPA. Walls encouraged the membership read all the information available and contact or call your local congressional representative to let them know how your see the issues. The report was accepted as given.
  2. Award committee: Committee chair John Wilcut presented the 1997 Distinguished Service Award to Bobby Walls. Walls was a charter member of the society and

served the society through committee work and serving as Treasurer, Vice President and President.

3. **Financial committee: An update on the status of Fidelity Index fund was given by Susan Rick, The history of how the fund is performing is reported with the Treasurers report. An outside group (Dean Witter) agreed that this was a suitable place for the societies money to be invested. The report was accepted as read.**
4. **Student Affairs committee: Committee chair, Vernon Langston reported on the student activities for 1997, Stanley Culpepper, Marv Paulsgrove and Andy Bailey received awards for papers given at the SWSS in Birmingham. The students also participated in the SWSS summer weed contests. The students as well as many members of the Society helped host the NEWSS summer contest. The winners of the Undergraduate paper contests were Phillip Patterson for first place, Amy Mabery second place and Branden Brewer was the third place winner. Prizes consisted of $125, $75 and $50, respectively for first, second and third place. Winners of the Graduate Poster contest were Jimmy Summerlin, first place and Andy Bailey second place. Prizes consisted of $150 and $ 100, respectively. Langston acknowledged and thanked the judges and sponsors of the meeting for supporting the contest. The report was accepted as given.**
5. **Newsletter committee: Monks reported that two newsletters were sent to the membership. The membership was encouraged to send information for the newsletter to Wayne Mitchem,editor.**
6. **Publication committee: Committee chair Fred Yelverton reported due to the cost, limited utility of the proceedings and difficulty of getting the information together the proceedings had not been printed. The membership however had voted to have some type of proceedings at the past meeting but due to difficulty of going back and getting information for the 1997 meeting, the committee chose to being publishing a report with the 1998 meeting. After some discussion, it was moved and seconded that the society should look into the possibility of having a homepage on the Internet. Shawn Askew volunteered to look into creating a home page and updating it. Suggestions for items to include were the purpose of the society, the officers and board members, historical information, and a number to contact for further information. The possibility of publishing the proceedings on the Internet will be evaluated. Committee report excepted as given.**
7. **Membership committee: The society membership has been stable over the past few years. There are currently 228 members which includes active members, student members and county pesticide coordinators. There are also supporting members.**
8. **Nomination committee: Past President Stew Sherrick gave the results of the recent election by the membership. David Jordan was elected Vice President, Bobby Walls secretary/treasurer, Roger Batts Director at Large, and Shawn Askew Student Representative. The report was accepted as read.**
9. **Historical committee: This was the 16th Annual meeting of the Society. Any information that a member has that should be maintained should be sent to Tom Monaco.**

- **Old Business: No old business was discussed.**

- **New Business:**

1. **A discussion was held on the funding level and selection of the undergraduate scholarships recipients. After much discussion it was voted by the membership that the Finance committee chair should be a member of the Student Affairs committee. These committees should evaluated whether the level of funding should be increased, whether an endowment fund should be started to provide additional funding, should review the selection criteria and should ensure the membership knows who the recipients are.**

2. **Monaco reported that NCSU and Clemson University were hosting the Horticulture Society meeting on July 12 - 15 in Charlotte, NC. It was noted that several host would be needed to help with the event which would draw 1500 participants. The WSSNC was asked to donate funds to help defray the cost of either the Welcome Dinner or Graduate Student Tour. It was moved and seconded that the society provide $500 to support the meeting. Motion passed.**
3. **The SWSS 1999 meeting will be held in Greensboro, NC. It was suggested that we set up a display at the meeting to advertise the society. The president should appoint a committee to follow up.**

 President Monks thanked the Board for helping him during his term as President. President Monks then passed the gavel to incoming president Tom Hunt.

 President Hunt presented David Monks with a plaque in appreciation of his service to the society as president.

 President Hunt adjourned the meeting at I:55 P.M. Respectfully submitted Susan K. Rick Secretary-Treasurer

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