

NORTHEASTERN WEED SCIENCE SOCIETY

HISTORY

1947 - 1995

ROBERT D. SWEET

## ACKNOWLEDGMENTS

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Robert D. Sweet

## PREFACE

From time to time after our 10th birthday members of NEWSS talked about the need for a written history. In 1961 a short history was compiled and a pamphlet was printed. Few details were included. Unfortunately it incorrectly reports circumstances about our name. Our official name in the early days was "The Northeastern Weed Control Conference", and it had been adopted at our first meeting, February 1947. Some years later the need for an archives was recognized, but little action was taken.

As more and more of our early members became deceased, and as our 50th meeting was on the horizon, discussions became more frequent and a sense of urgency prevailed. In the late 1980's a specific goal of having both a printed history as well as an established archives by the 50th meeting was agreed upon. I was to be responsible for the history and George Bayer agreed to establishing an archives. The arrangement made it convenient for our working together and was helpful in bringing both projects to fruition. The History is written and the Archives have been established at Cornell University.

Robert D. Sweet

It is the intent of this publication to provide significant facts about the northeastern regional weed control group. Information will be presented on its formation, each of its annual meetings, the issues and challenges it has dealt with, and the activities in which it has been engaged. It is beyond the scope of this publication to set forth the valuable contributions made by its many members. However, at least part of this aspect can be obtained in Part II from the list of award winners, symposia and workshop moderators, etc. for each year.

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## PART I

### I. Introduction

The 10-15 years following World War II saw profound changes throughout our society. Many of us believe that for agriculture it was the most revolutionary period either before or since. Many specifics could be cited, however, the basic process taking place was the elimination of much human and animal energy and the adoption of petroleum energy. Unfortunately, the highly significant role played by selective herbicides in facilitating the mechanization of agriculture is often overlooked. Some examples: many vegetable crops, such as carrots and onions, required several hundred man hours per acre to pull weeds but selective herbicides eliminated most of that labor. Corn had to be planted in hills, carefully spaced to permit cross cultivation, but selective herbicides permitted planting in rows and facilitated both cultivation and mechanical harvesting. Soybeans could be planted in closer rows. Innovative cropping systems could be evaluated without the constraints of having to remove weeds by hand or machine. In short, the agricultural revolution would have been slowed dramatically, and even today, some parts of the food production system would still be highly dependent on human energy, if selective herbicides were not available.



Handweeding Carrots 1944. That same year Stoddard Solvent was reported by Cornell and Massachusetts horticulturists to be a safe selective herbicide. Because there were few regulations at that time it became a universal treatment in 2 years.

(Photo courtesy E.V. Hardenburg)



Weedy corn fields were common prior to 2,4-D and atrazine.

(Photo from R.D. Sweet)

During World War II and in the early post-war years there was an acute shortage of labor, particularly on farms. At the same time, Federal agencies exhorted farmers to "Produce!" "Become the bread basket for the world!". In this setting, 2,4-D came out of the laboratories and quickly proved to be as significant to agriculture as were sulfa and penicillin to medicine and the atom bomb to warfare. Intense research and extension activity were stimulated. In fact, the amount of information becoming available in Weed Science was so large and the speed with which it was being generated was so rapid, that within a span of about five years, four regional professional groups were formed to facilitate the rapid exchange of information. They preceded a national group by several years. Weed Science is the only scientific discipline in modern times where the national group did not precede the regional societies.

In the mid-1940's peas were weeded in New York by postemergence sprays of 20% NaCl at 125 gallons per acre.

(Photo from R.D. Sweet)





Research plots in the mid-1940's received treatments now considered bizarre. This plot had 5 lbs 2,4-D per acre, 2 weeks before planting. All vegetables but sweet corn and potatoes were damaged.

(Photo from R.D. Sweet)



## II. Formation of NEWCC

In 1944, considerable excitement was created in the field of horticulture and the petroleum industry when Cornell and Massachusetts researchers, working independently, demonstrated that stoddard solvent, used undiluted, was a fine selective herbicide for carrots, other umbelliferae, and pine tree seedlings. Traditionally these crops required 100 or more hours of hand labor per acre for weed removal. Because of the acute labor shortage due to World War II, and because at that time petroleum products were exempt from government pesticide regulations, within two years stoddard solvent became the principle means for weeding these crops. It continued as the major herbicide until prices rose dramatically due to the oil embargo of the early 1970's.

In contrast to the limited impact of stoddard solvent, a monumental wave of excitement was created when 2,4-D and 2,4,5-T "escaped" from the biological warfare units of the U.S. and England respectively. In 1944 researchers at the Geneva, New York Agricultural Experiment Station applied some 2,4-D of dubious origin on bindweed growing in apple nurseries. Similar simple field testing was done privately near Philadelphia. The results demonstrated the potential for selective weeding of crops with "hormone-like" agents.

The private sector responded by the formation of new companies and by establishing herbicide groups within existing companies. Almost overnight several thousand persons both public and private began conducting short-term research on crop selectivity, rates, timing, the influences of weather, soil type, etc. Within months it became obvious that existing refereed journals could not

possibly meet the need for rapid exchange of information. In 1944 representatives from agencies which regulated noxious weeds organized the North Central Weed Control Conference. However, when 2,4-D came on the scene, the regulatory aspects were overwhelmed by agronomists and others who were interested in controlling all weeds which damaged crops.

However, no such group existed in the northeast. In the early winter of 1947, the Director of the Cornell Experiment Station issued an open invitation to all interested parties to participate in a workshop to exchange information on weed problems and to explore the feasibility of forming an organization of weed workers in the northeast. They convened on the Cornell campus February 18-19, 1947. A total of 84 persons registered. Forty two were from Colleges and experiment stations, 37 from industry, 2 from U.S.D.A., and 1 each from T.V.A., New York City Health Department and Brooklyn Botanic Garden. (Roster in Appendix).

Much of the first day's activities consisted of informal reports from the various states and agencies. Industrial representatives reported mostly as to what roles they hoped to play rather than on accomplishments. (Complete minutes are in the appendix).

Late in the day a procedural committee was elected. It was asked to prepare an agenda for the next day and to have specific proposals ready for discussion and voting regarding the future activities of the group. A nominating committee was elected and asked to prepare a slate for President, Vice President and Secretary/Treasurer.

However, before adjourning at the end of the first day, the group voted to form a regional organization of weed workers whose principle objectives would be:

1. To facilitate the exchange of information
2. To plan and coordinate research
3. Education. (to be developed later)

The group further agreed that the organization would strive for the closest possible cooperation between industry and station workers in all three of the above fields of activity. Typically, the office of President alternates between representatives of these two groups.

On the second day the first order of business was the report of the nominating committee. They proposed G.H. Ahlghen as chairman, B.H. Grigsby as Vice-Chairman and R.D. Sweet as secretary-treasurer. The slate was elected and took office immediately.

The procedure committee suggested the group split into 4 work groups for the balance of the morning and to report in the afternoon under the following format:

1. Definitions of problems
2. Current status of research
3. Suggested action by crops including:
  - a. materials
  - b. methods
  - c. equipment

This was done and the reports were included in the minutes.

Considerable time was then spent on matters related to the new organization. Decisions were reached as follows:

1. The name was to be "the Northeastern Weed Control Conference".
2. The present officers were to continue until the next meeting.
3. The next meeting was to be held in New York City sometime in February 1948.
4. A program committee and a research coordinating committee was elected.
5. A donation of \$1.00 per representative was requested to cover expenses until the next meeting. Since some had already left, only \$60.00 was collected. The secretary/treasurer was authorized "to give those persons an opportunity to donate". (Note: there is no record and Sweet has no recollection as to how many dollars were finally collected).

### **III. Activities**

The primary purpose of NEWSS throughout its history has been to facilitate the rapid exchange of information about weeds and their control. However it also engages in many related activities.

#### **1. Assisting Members**

##### **a. Meetings**

The annual meeting always has been the major activity designed to facilitate the rapid exchange of information. Talks are given by invited

speakers to the entire group. Individuals volunteered to present the results of their investigations in concurrent separate sessions organized according to interests. All speakers are urged to submit advance copies of their talks so they can be compiled into a proceedings available at the start of the meetings.

During the meeting time is set aside for committees to meet and finalize reports which are made in the business meeting. Items of significance are discussed, and when appropriate, are voted on by the membership. This policy of active membership participation in important organization matters has guaranteed lively business meetings. It also helps keep the membership aware of the fact it is their organization, not just one for a chosen few.

**b. Publications**

The principal publication continues to be the annual "Proceedings" which contains the papers presented at the annual meeting. The publication is available at the time of registration. Attendees can scan it in advance of concurrent sessions and make informed choices as to which presentations to attend. The Proceedings serve as a permanent reference in the personal libraries of many weed scientists. Indices of them are prepared from time to time.

**A supplement** to the Proceedings was published annually until 1990 when it was combined with the Proceedings. It contains information on the meeting itself such as a roster of attendees, financial report, actions at the business meeting, papers by invited speakers, etc. It also contains papers that were not received in time to be included in the Proceedings.

**Research reports** constituted a major effort in the early days of NEWSS. These were annual compilations of herbicides tested and results obtained on various weeds and crops. This information was particularly valuable to the horticulturists because during the 50's and 60's companies released numerous compounds at an early stage and usually had little information except on major field crops and on the weeds common to them, particularly in the midwest. Researchers often found that rates needed for adequate control were less in the northeast than those required in the cornbelt. Also, horticulturists in the early years often supplied companies with information regarding crop selectivity with numbered compounds. It was discontinued about 1974 because members no longer found it useful.

**c. Field Days**

Field days or open houses play a major role in keeping weed scientists

informed on current research. However, until the mid-50's there were no scheduled field days. Individuals would contact a researcher, often on short notice, and ask to view his field research. Sometimes the projects of most interest to the visitor were not at a good stage for viewing and in a few instances may already have been evaluated and destroyed. In the mid-50's, Agway (GLF) invited University personnel to tour their corn plots in New York, New Jersey, and Pennsylvania. A caravan of cars made the tour annually. Also in the late 50's, U.S.D.A scientists at Beltsville had "open house" in early summer to view their field program with horticultural crops, turf, and experimental herbicides.

With more and more field research being conducted at more locations, it became apparent that coordination of scheduling was sorely needed. In the early 60's NEWSS scheduled a time during the annual meeting when all those who were planning a summer field day could meet and work out a schedule. This practice continues to the present.

#### d. Awards

In 1955 NEWSS began recognizing authors of outstanding papers, and continues to do so. Additional awards were initiated in 1971, 1979, 1983, 1986, and 1991. Frequently awards are sponsored by industry and include a cash prize. (See Part II for recipients).

**The Award of Merit** began in 1971 and recognizes a long career in weed science with attendance and active participation in affairs of the society for at least five years.

**Distinguished Member.** This award was initiated in 1979 and is the highest honor the society presents. It recognizes, both service to the society and contributions to weed science. The award is limited to a maximum of three persons per year.

**Innovator of the Year.** This award considers contributions in either extension, teaching, or research. The award recognizes ideas or approaches which are novel, have practical application, and are likely to have a significant impact in weed science. It was initiated in 1986 and has been awarded only five times to date as worthy candidates are identified.

FIELD DAYS  
THEN: AMCHEM 1958\*



Viewing Plots



Eating

NOTE:

1. No Women
2. Plots exclusively oriented towards chemicals
3. Many white shirts, some ties and jackets
4. No hats or caps

\*Photos from Gallagher

FIELD DAYS - NOW: CORNELL 1994\*



Viewing chemical plots



Viewing new equipment

- NOTE:
1. Many women in weed science.
  2. New cultivation equipment and innovative cropping systems are being investigated.
  3. Colorful shirts, shorts, and hats are common place.
  4. Yes, people eat at Cornell, but that did not warrant a picture.

\*Photos from L.D. Topoleski

**The Outstanding Applied Research** award was initiated in 1991 and consists of two distinct sections; one involves food and feed crops, the other turf, ornamentals, and vegetation management. Each award recognizes applied research that directly benefits the clientele of that section.

In more recent years, the importance of the poster sessions has increased, and awards were initiated in 1983 to recognize those with excellent quality of graphics and clarity of message.

**Extension** awards were presented in 1954, 1957, and 1959. They honored county agents, and regional or state weed specialists who were conducting outstanding programs. At that time extension was struggling to provide users with up-to-date valid information on weeds and their control. This new discipline of weed science did not fit the customary extension programs at either the state or the county levels. As extension adjusted, it offered its own awards and there became little need for ours, so it was soon discontinued.

**e. Job Placement**

In the 60's and 70's, when job openings were plentiful and candidates were few, NEWSS conducted an active placement service. It provided information about positions available as well as resumes of candidates seeking positions. In the last 2 or 3 years however, few positions have been available and many of those are not advertized. Also, due to a shortage of support funds fewer graduate students are being trained. Thus the NEWSS placement service is used very little. The major activity in this area is by WSSA.

**f. Recertification**

Many members of NEWSS are "certified" (licensed) pesticide applicators. Annual meetings serve as training sessions that help participants earn "credits" towards re-certification. However, states vary widely as to the procedures they require for receiving credits. It has been a challenge to develop procedures that are acceptable to the states, meet the needs of our diverse audience, and are workable at the annual meeting, particularly during concurrent sessions. Unfortunately, as personnel changes at state regulatory agencies, there often are changes made as to what the state requires from NEWSS at its annual meeting. Thus no stable operating procedures can be developed. Each year there is a last minute struggle to adjust NEWSS so that members from all states can be accommodated.



## **2. Enhancing Graduate Student Training and Experience**

The Society has always recognized the major contributions graduate students make to research programs at Universities. Also, industry is well aware that it is highly dependent on Universities for providing a pool of well trained young weed scientists to fill their positions. NEWSS and industry have joined their efforts to enhance graduate student training and experience through three activities, i.e., mixers, awards, and weed contests.

a. **Mixers** are generally provided in the evening at the start of the annual meeting. Often a speaker will make a short presentation as to job opportunities as well as the training desirable for the various positions. Generally, representatives from industry, university, and regulatory agencies are present to give their perspectives. The remainder of the evening is spent in informal discussion, often far-ranging from the original topic.

b. **Awards** have been given to graduate students, starting in 1979, for the best oral presentations of papers contained in the proceedings. Frequently there are 15-30 papers in the contest and the competition is keen. Winners have a fine contribution to their resumes as they enter the job market. Furthermore the training and experience gained aids all participants throughout their careers.

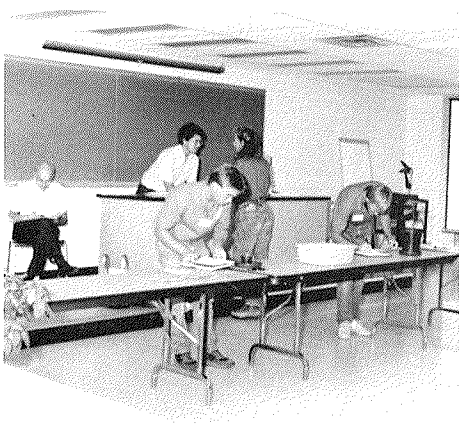
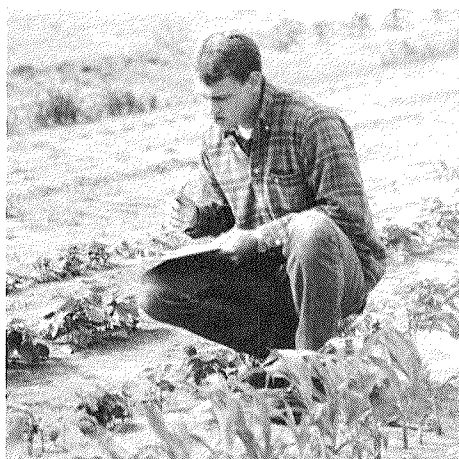
c. **Weed Contests**. The idea of collegiate weed contests came to NEWSS from the North Carolina Conference and was initiated here in 1983. Industry provides financial support as well as personnel and field facilities. In recent years as well as the start Universities provided facilities and have always provided personnel. Many aspects of weed science are included, e.g., weed identification, trouble shooting, sprayer calibration, etc. Pictures (pages 13 and 14) are of the 1992 contest at the Ridgetown College of Agricultural Technology, Ontario Canada.

## **3. Strengthening Weed Science**

### **a. Southern Weed Conference**

NEWCC designated Yowell and Sweet to be observers/resource persons at the organizational meeting of the Southern Weed Conference held in the winter of 1948 in Baton Rouge, Louisiana. Amongst many items, the group discussed in some detail the differences between the North Central and the Northeastern Weed Control Conferences, particularly regarding membership and voting rights. (The Western group was not formed until 1949). The sentiment was overwhelming in favor of open membership with voting rights.

## WEED CONTEST 1992

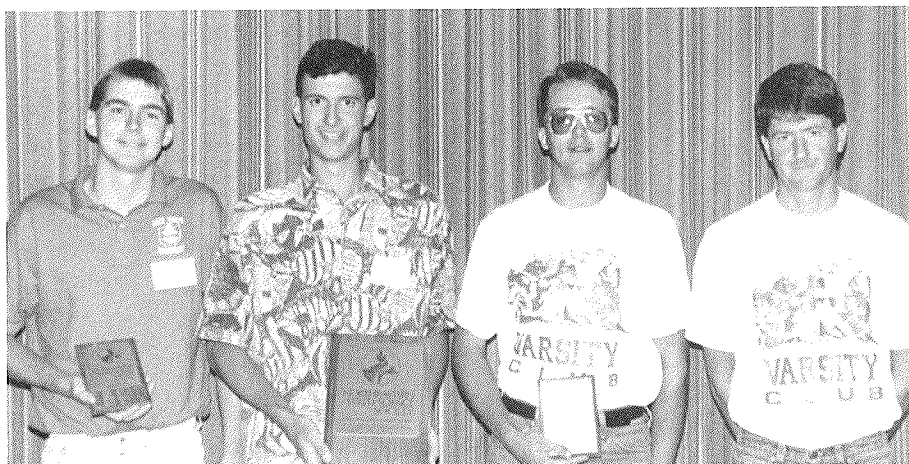


(Photos from Ridgetown)



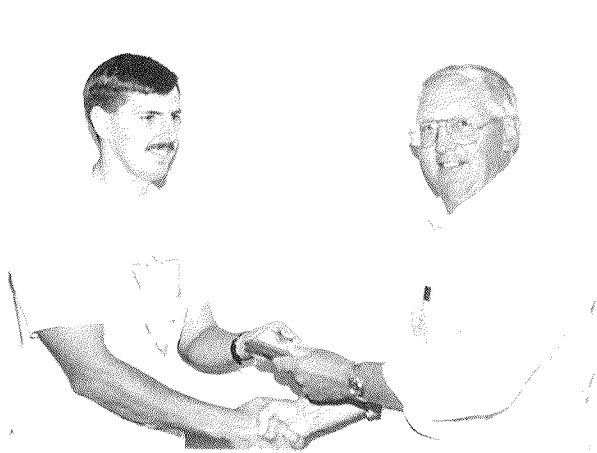
Graduate  
Team Winners  
Michigan  
State U.

L to R:  
Dr. Karen  
Reimer, Karen  
Novosel,  
Aaron Hager,  
Troy Bauer,  
Rick Schmenk,  
Boyd Carey,  
Dr. Jim Kells

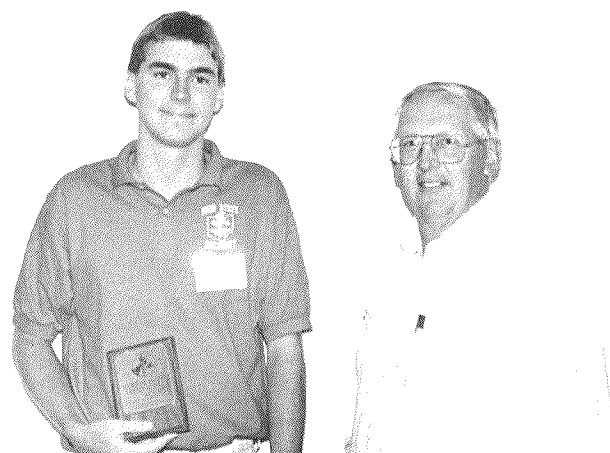


Undergraduate  
Team Winners  
Ohio State  
University

L to R:  
Jeff Stachler,  
Erik Lepley,  
Jason Webb,  
Dr. Mark



Individual Graduate Winner:  
Troy Bauer and President Pruss



Individual Undergraduate Winner:  
Jeff Stachler and President Pruss

**b. WSSA**

At the time the regionals were being formed, a substantial number of persons believed a national organization would be highly desirable. This view seemed to be shared by all four regional groups, and in the spring of 1951, each appointed two persons to participate in a meeting in the midwest to develop a proposal that would be brought back to the regionals for a vote. Yowell and Sweet represented NEWCC. It proved to be a very frustrating experience. Three of the groups wanted to develop a positive plan but the representatives from the North Central Weed Control Conference were strongly opposed to a National. They expressed three reasons for their views:

1. A national organization would undermine the fine success they were now enjoying, e.g., attendance was high, numerous papers and reports were being given, and industry supported a good trade show.
2. NCWCC only permitted 1 vote per state on important business matters. This system was part of the "legacy" that came when they overwhelmed the existing state regulatory agencies in forming NCWCC.
3. How could anyone expect them to work cooperatively with a group like NEWCC which permitted every member to vote and, additionally, welcomed persons from industry as members and officers?

After a day and half of acrimonious wrangling, it was apparent no truly national society could be formed and a compromise was needed. The following proposal was eventually developed:

1. An association of the four regional groups would be formed, with each having two members on its board, but no individual members.
2. Its principal purpose was to publish a refereed journal for weed research papers. Its name was to be "Weeds", and was to be financed by advertising. Sweet was named editor.
3. The association would not hold separate meetings but would be "hosted" by each of the regionals at their annual meetings.
4. After meeting with all four groups, the question of forming a true national society would be voted on.

The Executive Committees of each of the regionals quickly approved the proposal and the first issue of "Weeds" was printed in October 1951.

During the next four years the support for forming a national society became overwhelming. People asked the practical question, "why do we need permission from anyone, why don't we just go ahead and do it?" "Dutch" Sylvester, a leader in the midwest was chairman of the Association of Regional Weed Control Conferences in 1953. He made a strong plea for the NCWCC to support a national weed organization at their 1953 meeting, but to no avail. However, in 1954 support was voted. In 1956 NEWCC hosted the charter meeting of the Weed Society of America (WSA) which later became WSSA.

Many of the members of NEWCC as well as those of the other regional groups became members of WSSA, and the custom of belonging to both a regional group and the national society continues to date. Each regional group selects a representative who sits on the board of WSSA.



NEWSS Members Named Fellows by WSSA 1974  
L to R: Dayton Klingman, USDA, Beltsville; Paul Santleman,  
Maryland - U. of Oklahoma; R.D. Sweet, Cornell Univ.; L. L.  
Danielson, Va. Truck Agr. Exp. Sta.

(Photo from WSSA)

#### **4. Increasing Public Understanding of Weed Science and Agriculture**

Ever since Rachel Carson's book "Silent Spring" (1952), the public has been raising questions about pesticides, including herbicides. At times the rhetoric has been extreme and the media have played up fears about health hazards and potential degradation of the environment. Since the early 50's, government reaction has been to strengthen regulatory requirements from their early inadequate scope to the point where they are extremely burdensome financially. Some scientists feel they are now unrealistically stringent and are seeking to have reviews of the major risk/benefit assumptions underlying the regulations.

NEWSS has responded to regulatory actions and public concerns about herbicides in several ways. It has joined CAST, cooperated with WSSA in developing and presenting "position papers" on major issues, formed its own legislative committee, and has a public relations committee.

##### **a. CAST**

NEWSS joined the Council on Agriculture Science and Technology (CAST) in 1979. This is a consortium of about 30 professional societies with an interest in agriculture. It publishes material regarding the available scientific aspects bearing on important national issues and concerns. Their publications are sent to legislators, regulatory agencies and the media. NEWSS, like all member societies, selects a person to represent it on the CAST Board of Directors. One important opportunity for directors is to suggest possible topics for publication. Several, such as pesticides in fruits and vegetables and safety of 2,4-D, have been the direct result of NEWSS requests.

##### **b. Legislative**

Independently over the past 15 years NEWSS, has tried to influence legislation but with little success. More recently it has joined with WSSA in developing and presenting "position papers". It is too early to assess their impact, but at least legislators and staff are meeting with our representatives. Another recent activity is for individuals to react quickly to any proposed legislative action which appears flawed or inappropriate. Furthermore, attempts are made to have face to face constructive conversations with those responsible for the regulatory proposals so that difficulties we perceive can be explained and perhaps eliminated or modified. Currently this procedure is being tested regarding guidelines for research techniques needed to provide EPA with valid data for risk/benefit analysis of a particular herbicide or alternative control measure.

### c. Public Relations

The society uses this committee to provide information regarding meeting highlights, officers, award winners, etc. to local and regional media. It does not engage in activities to promote weed science or to influence regulatory actions.

## IV. **Issues and Challenges**

Although specific information on dates, places, officers, programs, etc. are an important part of NEWSS history, another aspect which adds "flesh and blood to the bones of history" is a digest of the issues and challenges we have encountered. Some of these have been strictly internal matters, whereas others have been thrust upon us by economic changes and by public opinion. Some have been solved, but others remain as challenges.

### 1. Principles Guiding NEWCC

Three of the many decisions reached at the organizational meeting held February 17-18, 1947 have proved to be basic principles which have served us well for nearly 50 years and should continue to do so into the foreseeable future.

1. Our main objective is to facilitate the rapid exchange of information.
2. Membership and voting rights are open to every one interested in weeds.
3. We pledged that representatives from the public and private sectors would work closely together in all society matters.

It was not just luck that these three principles were adopted with little debate at that first meeting. Many weed workers agreed an organization was needed. Inquiries were made regarding the North Central Weed Control Conference that had been formed in 1944. They were able to move quickly because the "new breed" of weed workers essentially overwhelmed an organization of state agencies which dealt with the regulatory aspects of noxious weeds. However, that quick start meant that some of the procedures were continued unchanged. For example, each state had 1 vote, and the person with the privilege was designated by the state agriculture department. No others had voting rights. Meanwhile, a consensus was building in the

northeast to form an organization of weed workers in which anyone could join and every member would have a vote. There was a small minority, particularly amongst botanists and physiologists, who were strongly opposed to a professional organization permitting persons from the private sector to have voting rights. However, they would be welcome to pay membership fees, make corporate gifts, etc. Although the invitation issued by Cornell went to everyone, that small group chose not to participate. Thus the key principles were adopted with no debate.

## 2. Rating Systems

In the late 40's and 50's research in weed control with selective herbicides lacked even informal protocols. Budgets were limited and there were few trained people available for gathering the data. It became apparent that in order to obtain the large amount of data needed, short-cuts had to be developed. Soon, researchers resorted to visual evaluations and expressing the observations numerically or as ratings, rather than by taking actual measurements on height, weight, numbers, etc.

As would be expected, there were great variations in how researchers "rated" their plots. Some used 1-5, 1-9, or 1-10, others used percentages. The Europeans had a very sophisticated 1-10 rating that was based on a sigmoid curve with the truly definitive parts at each end of the curve. On investigation it was learned they spent many hours gathering the hard data first and then converting it to the ratings. This was done to make it easier to evaluate the hard data, not as a shortcut in obtaining crop and weed responses. The NEWCC tried to standardize rating systems, but individual researchers resisted. Today most use a 1-10 system, and many intend their system to be easily converted to percentages. However, there still exists a certain ambiguity in interpreting the data.

Does a rating of "5", or 50%, for weed control mean that weed numbers were reduced by half or that weed size was reduced and numbers remained unchanged? Similar questions arise with ratings of crops. Does the rating reflect the number of crop plants showing damage, or the average extent of damage to all plants? The answers vary between researchers. NEWSS encourages authors to obtain hard data and avoid ratings where feasible. When ratings are used, authors are requested to explain them precisely.

## 3. Nominations

By the late 60's NEWCC had good procedures in place for most activities. The Executive Committee functioned well. Business meetings



changed from being marked by lively discussions to ones which received routine reports of actions taken by officers, committee chairs, etc. During this same period there was great turbulence in society as a whole. Institutions of all types, including Universities, came under verbal and sometimes violent physical attack for being too set in their ways and for excluding younger people from the policy making process. NEWCC did not escape, and identical charges were leveled at the Executive Committee. No one claimed its decisions were poor, but that it was an "Old Boys Club" from which "youth" was excluded. After a particularly stormy session in the 1972 annual business meeting, a consensus was reached that the situation could best be remedied by making a revolutionary change in how the nominating committee was to be selected. The membership voted to have three of the five members selected from the floor during the annual business meeting rather than appointed by the President. This unique procedure was instituted at once, and because it works, it continues today.

#### 4. NEWCC Becomes NEWSS

When "Sputnik", the first orbiting satellite, was launched by the Russians in 1957, there were far-reaching and sometimes wholly unpredictable results. Almost instantly after that historic launch, "Science" became not only a favorite subject of discussion but also one of the most worthy of causes on which to shower public money. Institutions, agencies, and organizations changed their names so that everyone would be aware of how "scientific" they were. Even the venerable Land Grant Colleges succumbed to the public mood and almost overnight became "Universities". A few which were in states with high urban populations even abandoned the word "agriculture". Yes, we too reflected the general mood, and in 1970 NEWCC voted to become the "Northeastern Weed Science Society" (NEWSS).

A companion move at the time was for us to publish a refereed journal. This proposal never had solid support. Some members relied on our long held view that we existed to provide rapid exchange of information and no refereed journal was "rapid". Furthermore WSSA was already doing that job and there was no need for us to try to duplicate their efforts. The idea was dropped after a couple of year's discussion.

#### 5. Proceedings

From the beginning the annual proceedings has served as the major vehicle for weed researchers in the northeast to communicate their current activities and findings. For the first 20 years or so about 125 papers accounting for 600-700 pages were in the proceedings yearly. Once again

outside influences forced great changes on us and in recent years less than half as many papers and pages are published. A major impediment has been the gradual tightening of rules about "prior publication" that have been instituted by editors of refereed journals, where some weed researchers might wish to publish their completed projects. In the early days non-reviewed papers in our proceedings were not considered as "prior publication". Then, editors decided not to permit a full paper, but abstracts were O.K. Currently, even abstracts are suspect if any data are included. Another difficulty is that some University administrators will not give credit to young professors for publishing non-refereed papers.

## 6. Metric Measurements

Another result of "Sputnik" was a determined effort to put the U.S. on the metric system and get rid of those "non-sensical measurements" for distance, weight, volume, speed, etc. characteristic of the "English" system. Most refereed journals including "Weed Science" and the agronomy journals changed to metric. There was a similar effort regarding proceedings of NEWSS, but support was far from unanimous. Although we voted to become a weed science society at the 1970 business meeting, the push to have "metric" in the proceedings did not show results until 1972. However, the policy has been ambivalent over the past 20 years. Sometimes authors used only metric, sometimes both and a few refused to change. NEWSS in 1980 recognized that many persons reading our proceedings are not thoroughly familiar with metric and as a consequence relaxed its pressure on authors to use metric. Once again what happens in the public sector has had its influence on NEWSS.

## 7. Political Activity

In its early years NEWSS did not consider a role in political and legislative as important. However, as the use of herbicides and all pesticides expanded at a very rapid rate, so did concerns by the public. Negative and sometimes inaccurate stories by the media increased and radical state and federal regulations were proposed.

A public relations position was added to the Executive Committee in the mid 1970's. However participation by members as a whole was very limited. Two schools of thought prevailed amongst the members. One was that NEWSS should be active in informing the public and in trying to influence the legislation. Another group held the view that we were a research organization and should not get involved in political issues. In the early 80's the phenoxy issue further fueled the call for more restrictions or even elimination of

pesticides, including herbicides. Several presidents of NEWSS as well as invited speakers urged more involvement. Finally the proposal to ban 2,4-D solidified opinion of our membership in favor of becoming involved. In 1987 it voted to formally request CAST to make an investigation into the 2,4-D issue and evaluate all conceivable risks. WSSA joined in our request and CAST published a comprehensive document that has proved to be a valuable resource for regulatory decision making.

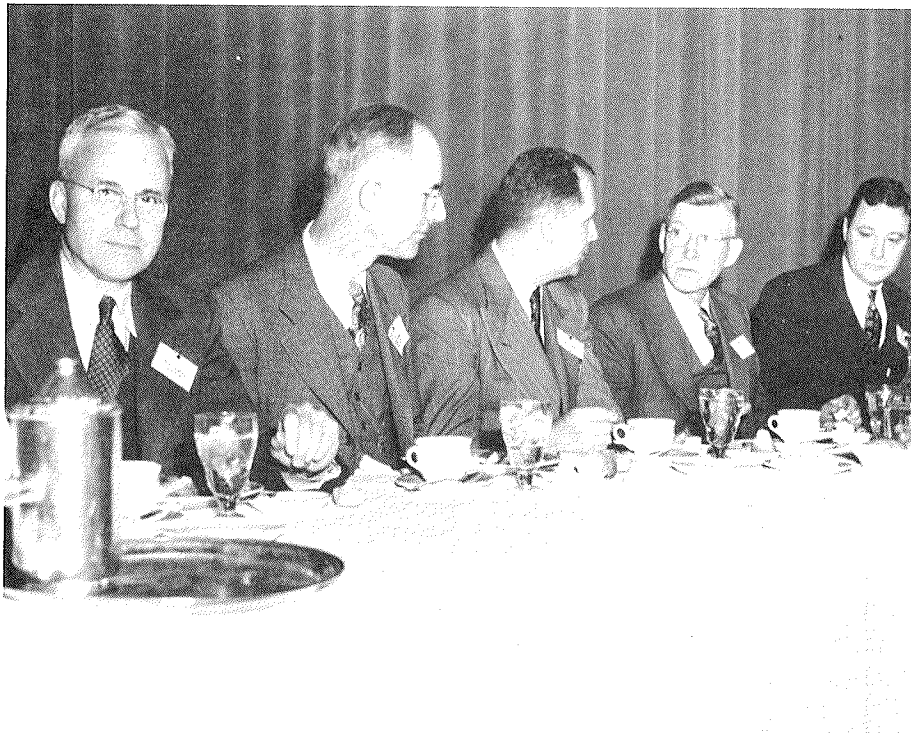
By the late 80's actions on pesticide issues by both state and federal agencies were impacting all aspects of pesticide use. In 1990, after investigating several possible courses of action, NEWSS established a legislative committee which was to interact at both the state and federal levels. This was positive action and the committee has been serving us well since that time.

## 8. Meetings

**Sites.** If one reviews the many sites where NEWSS has held its meetings (Part II) no clear pattern emerges. Actually, NEWSS has been responding to very real "outside" forces. Except for the organizational meeting in 1947, the society has been meeting in hotels and resort complexes. They offer the facilities and meal services required for a successful meeting. Also, the sites chosen usually afford good access by car or plane. From 1948 to 1973 meetings were in New York City, usually at the Hotel New Yorker or Commodore. In those early years the situation was nearly ideal. Transportation to New York was excellent, and because we met in early January we utilized a period of low demand for hotels. Prices of rooms and meals were favorable and service excellent. Unfortunately, the situation gradually deteriorated. Prices increased and services declined. This was particularly true for official meals and for use and operation of projection equipment. Substantial charges were imposed even though our members furnished the equipment and operated it. We then began to meet in other cities as well as resorts in Atlantic City, the Catskills, and Williamsburg. More recently we have tried to alternate between a northern site such as Boston and a southern one such as Baltimore. Although some fine hotels have been selected, no meeting site has matched the all around excellence of New York City in the 50's and early 60's.

**Format.** Although there have been some modifications from time to time, the basic format of the annual meetings remains much as it has been since 1948, i.e., committee meetings, general session, concurrent specialized sessions and a business meeting.

**Banquets and Luncheons** were regular events in the early years. Awards were presented and an invited speaker was featured. As costs soared, banquets were eliminated and finally luncheons also had to be dropped. A late afternoon or early evening "mixer" was substituted and continues to the present.



Head Table 1950 Luncheon

L to R: L.W. Kephart, USDA Weed Scientist; C.J. Willard, Ohio State U. Guest from NCWCC; R.D. Sweet, Cornell U. Pres. NEWCC; C. Chester Dumond, New York Commissioner of Agr.; G.H. Ahlgren, Rutgers, 1st Pres. NEWCC

Note: Meal cost \$3.50, including tip. (Photo from R.D. Sweet)

**Evening Sessions** were held at the first few meetings. However, they were not unanimously welcomed by the membership. Some wanted evenings free to enjoy New York's wealth of theater and sports. Others wished to have more time to enjoy the many hospitality suites sponsored by private industry. These became very lavish in the 60's and 70's. It should come as no surprise that after three years evening sessions became as dead as the "Dodo bird" under these pragmatic considerations.

**Workshops and Symposia** gradually became part of the meetings as the body of weed science information increased. Subjects or topics are chosen

that represent areas of high interest and have varied greatly as to the area addressed. (See Part II) Often speakers are invited from outside the northeast, and this is proving to be more and more costly. To date the society handles the costs of speakers for each program on an ad hoc basis. Presumably the time is at hand when a regular budget line for cost of speakers must be developed.

**Presidential Addresses** were not customary at early meetings. Instead the President reported on society matters, set the stage for the business meeting and announced special ad hoc committees. The first formal address was given by President G.D. Hill in 1966. At this same session C.L. Hovey gave a critique of the NEWCC to date.

**Business Meetings** have usually been well attended, primarily because the membership has customarily played a significant role in shaping society policies. In those years where controversial items are on the agenda, attendance at the business meeting rivals that of the general session. Officers and committee chairs have always given reports, but in the 70's they began to be so detailed that several hours were required just to receive reports. A modified system was then put in place and is working well today. Written reports are prepared in advance and distributed to members as they enter the meeting. Officers and chairs give a very short summary of their reports and if there are no questions or comments, the reports are received and the meeting progresses.

**Attendance** rapidly climbed from 84 in 1947 to the 500's in the mid-50's and to a high of more than 700 in 1964 and 1965. (see Appendix 3) However, a sharp decline began in the early 70's and attendance fell to somewhat more than 300 where it has remained to this time. This reflects not only reduced budgets at Universities and agribusiness consolidations, but also changes in the regulatory climate as well as the scientific attitude referred to in the section on our change in name. A significant number of attendees in the 50's and 60's were either engaged in herbicide application, or sold products directly to applicators. They relied on data from our annual meeting to help make decisions for the coming season. Often speakers gave explicit suggestions as to how experimental or new herbicides should be used. This was particularly true for new products on horticultural crops because companies were busy developing information on agronomic crops. Out in the "real world", extension was caught in the same struggle as potential users in trying to obtain the latest word and many agents attended. All this came to a halt as regulatory agencies began tightening the rules. Also, researchers were spending more time on factors influencing herbicide efficacy and consistency, weed life cycles, etc., and fewer emphasized directions for use.

Many stopped attending NEWSS meetings because little practical new information was being presented.

The attendance question is still being debated. In 1993 the society coordinated some of its sessions to fit in with trade associations which were meeting in the same city at the same time. The results are being evaluated. However, the basic question still unresolved is: does the society adhere strictly to its basic principle "The rapid exchange of weed science research information" or does it make some modifications?

**Trade Shows** including equipment displays, were attempted the first few meetings, but the obstacles to them in New York City were formidable and soon were dropped. Since that time industry has had information booths in the same area as the Poster Session and this practice seems to be working well. Industry provides substantial financial support through sustaining memberships.

#### **9. Commercial Equipment**

In the Northeast more than 20 years elapsed before special herbicide sprayers were adopted by all growers of the many diverse crops which make up our commercial agriculture. Growers of agronomic crops were first to get weed sprayers. In part this reflected the usefulness of 2,4-D, but it also was due to the fact that few of those farmers had any crop sprayers at all. In contrast, most fruit and vegetable growers already owned sprayers suited to insecticides and fungicides. Their attitude led to some very serious complaints of herbicide damage to nearby sensitive crops, drift to non-target areas, contamination of sprayers, etc. before the message came across, "herbicides are not just another pesticide".

### **V. NEWSS and Trends in Weed Science Research**

NEWSS can be justly proud of the many major contributions to weed science made by its members in the early days and continuing to the present. This account will not attempt to identify individuals, or to assign "firsts" to make discoveries, but will discuss areas of activity. (For some details on individuals see part II).



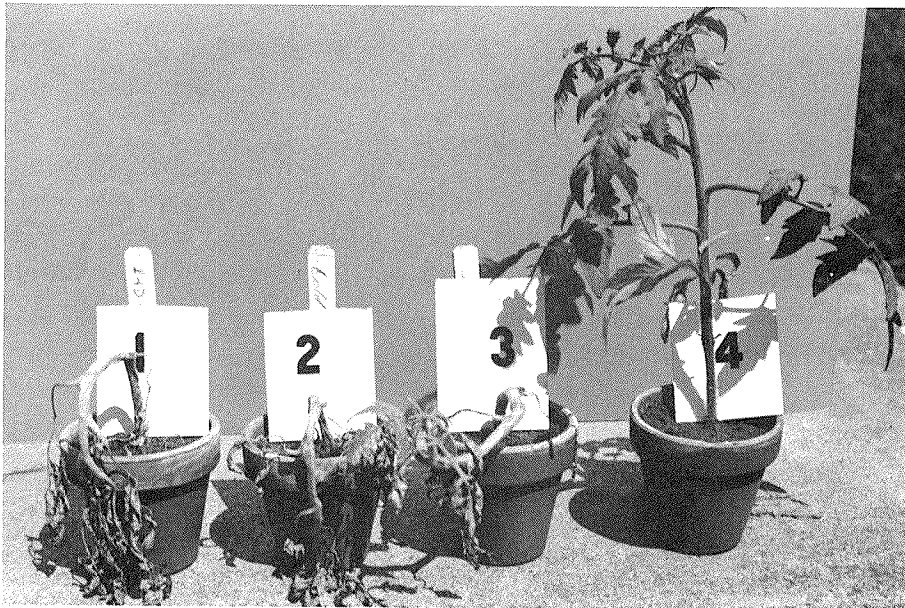
Farm Sprayer in late 1940's. Note the direct connect P.T.O. pump and hand operated spray gun.



The Jeep Weed Sprayer was a real workhorse in the Northeast in the late 1940's and 1950's for field crops (Photos from G. Bayer)



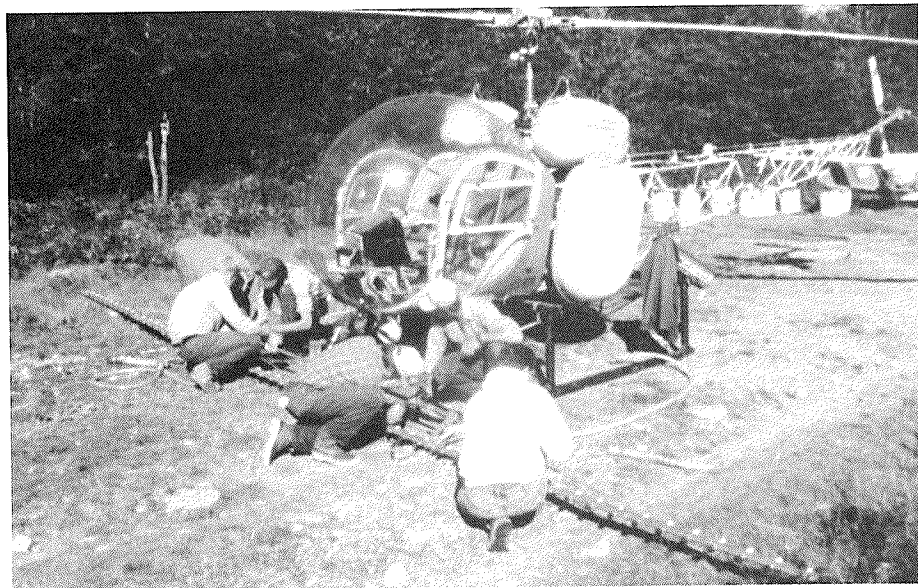
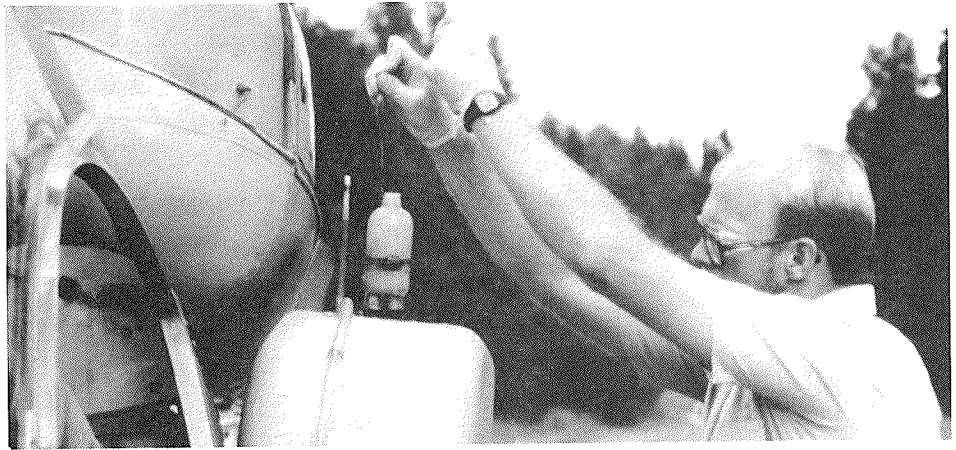
Row crop sprayers in the 60's and 70's were well adapted for controlling insects and diseases. Unfortunately many operators were slow to reduce pressure, lower gallonage etc. (Photo from John Bean Co.)



These test tomatoes demonstrated that 2,4-D could not be cleaned from a row crop sprayer with just a water rinse. (Photo from R.D. Sweet)

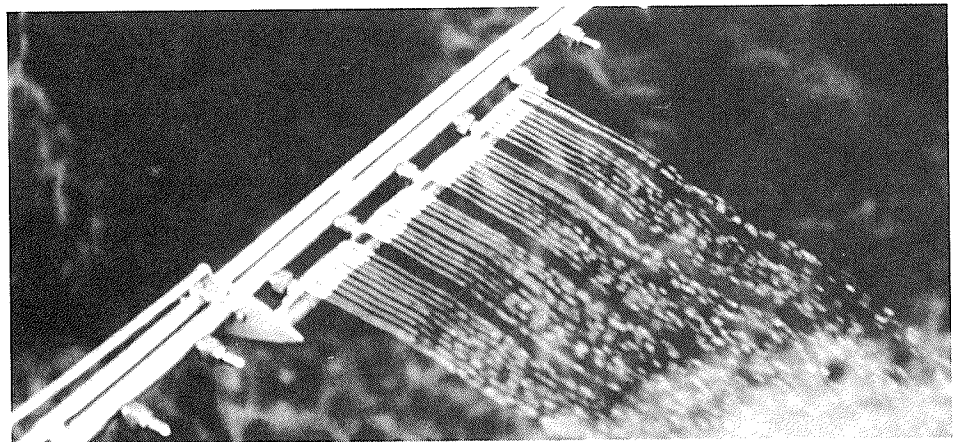


Checking  
test-spray  
colorant.



Many hands needed for changing nozzles.

Modified  
Microfoil  
Boom



Aerial spraying is a must in the Northeast. Max McCormack Jr. and cooperators have been instrumental in making these applications more site specific.

(Photos from McCormack).

### 1. Small-plot Sprayers

Weed researchers in the early years who tried to utilize small plots discovered that no suitable application equipment was available. Existing sprayers had three deficiencies:

1. Nozzles were either solid or hollow cone and unsuited to herbicides.
2. Pressure was pumped by hand and since they did not have pressure regulators, dosages were often variable.
3. Tanks were easily contaminated and very difficult to clean.

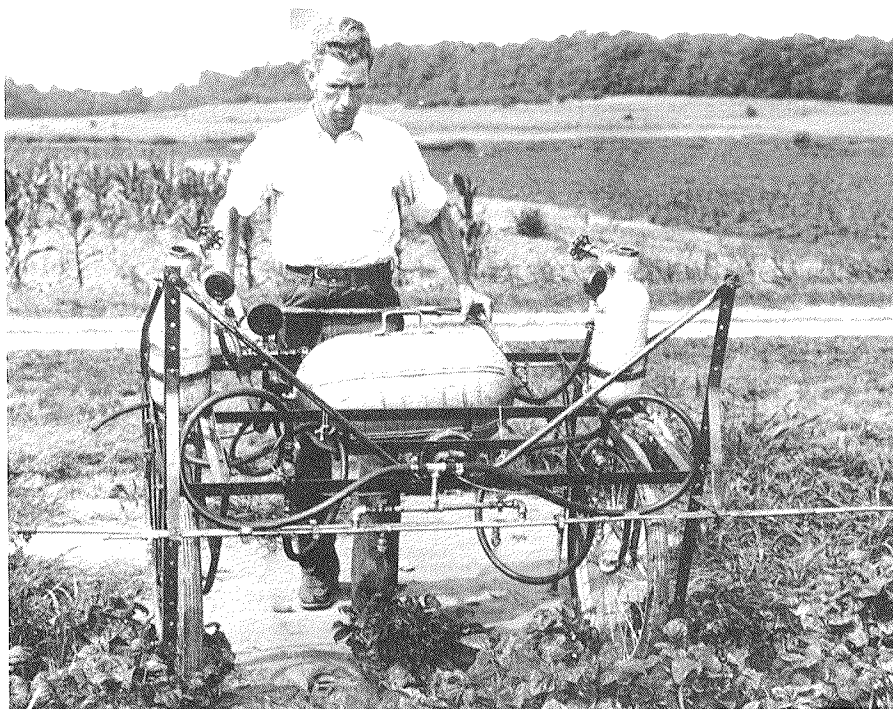
A fourth problem was encountered by workers who were trying to evaluate experimental herbicides and for which the companies had not yet established the appropriate dosage ranges for very many weeds or crops.

The nozzle problem was solved in the late 40's by Spraying Systems Company with its development of low volume, low pressure, flat-fan nozzles.

A hand-propelled "bicycle" sprayer was developed at Beltsville in the late 40's. Unique features were a re-chargeable compressed air tank with a pressure regulating delivery valve to propel the spray, a speedometer to monitor walking speed, and a small, easily detachable tank to hold the spray. A boom plus all components were mounted on a light weight frame with bicycle wheels at each end. The sprayer was an instant success for use in turf and other plots with firm soil free of stones and clods.

A light weight hand-held sprayer was developed at Cornell in 1950 which overcame the problems encountered with the bicycle sprayer in soft seed beds and cloddy or stony soils. It featured a small CO<sub>2</sub> cylinder for pressure with built-in regulator and quick-attached glass milk bottles in a perforated metal safety shield for spray liquid. Quick-attach booms for plots from 2' to 9' in width were utilized so that only one pass was required per plot. Soon many "hand-held" sprayers were in use, often with variations from the Cornell design.

The problem of establishing appropriate dosage levels for experimental herbicides was solved in principle in England. Two tanks were connected in series. A large tank contained plain water and a small tank contained spray concentrate. Water was forced into the concentrate tank and the mixture became progressively more diluted on a logarithmic curve. However, since the sprayer was large and required vigorous agitation, it was not suited to small plots. To utilize this principle, in 1969 the Cornell group connected a pint "concentrate" bottle to the quart bottle regularly used, and filled the latter with



Bicycle Sprayer developed at Beltsville in the late 1940's. Charles Ousler, a colleague of Warren Shaw, is the operator. It worked well in firm soils and turf.

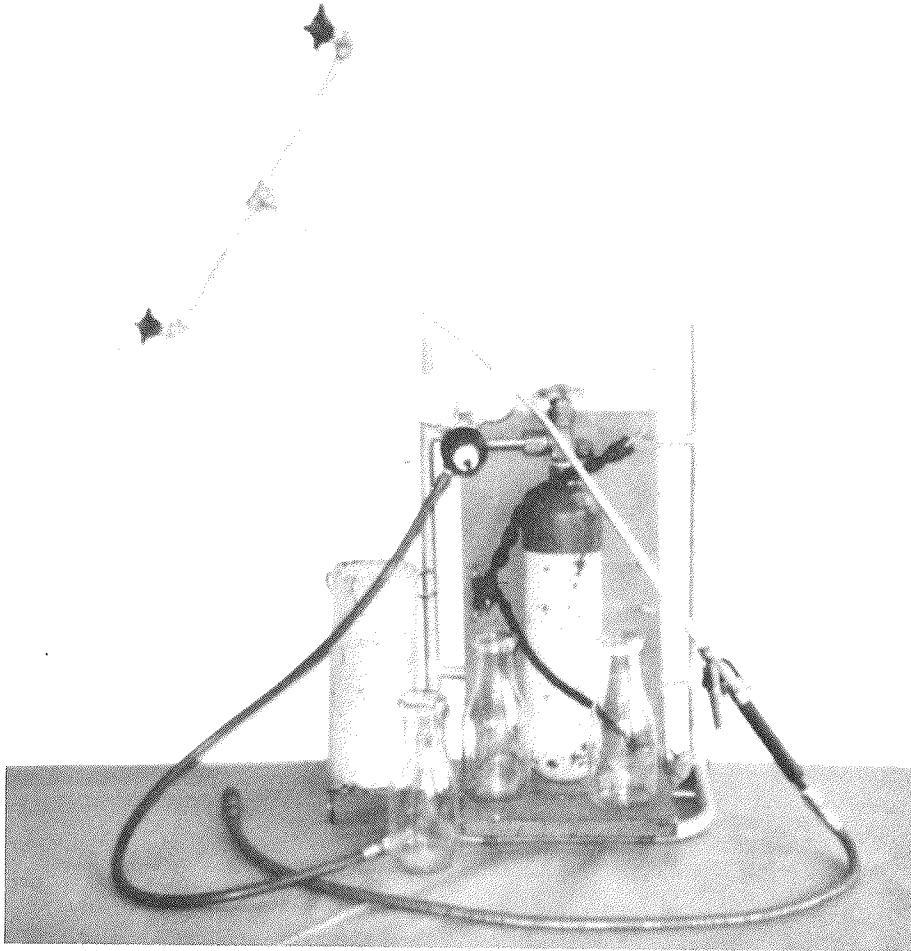
(Photo from Agr. Research July 1992).



Brass Spray Wand

The Solo model 425 knapsack sprayer Ahrens brass wand assembly is supplied with three interchangeable nozzle tips. The tips selected depends on the spray swath width desired. The Teejet 8004-E tip produces a band 1'-4' wide; the Teejet TK-2 tip, a width 3'-6' and the 1/4" KLC-5 tip a swath of 6'-14'. The swath width can be changed by the height of the nozzle above the ground or the top of the "target" crop being sprayed and the angle of the tip in relation to the direction of travel.

This was developed by John Ahrens and was useful in tree plantations, nurseries, etc. (Photo from R. Hansen).



Hand-held back-pack sprayers were not well accepted in the early 1950's. However, their usefulness for small plots soon convinced most skeptics. The 2-bottle version made a fine variable dosage sprayer, useful in finding activity ranges, proportions in combinations, etc.



Dean Davis is using the Cornell version of the back-pack to spray onions. The curved boom allows the operator to walk outside the plots.

(Photos from Cornell)



A shielded hand-sprayer being shown by Art Bing. Shielding of both hand-held and tractor sprayers is still common in horticultural crops.

(Photo from Senesac)



A tractor sprayer for moderate size research plots. Note protective clothing etc. Only in recent years have researchers used recommended safety gear.

(Photo from Topoleski)

plain water. No mechanical mixing was required because, fortuitously, the sloping sides of the pint bottle gave nearly instant mixing provided it was held upside down and water entered and left at the neck. Logarithmic dosage plots were customarily evaluated at half-dosage intervals. Little precision was possible at the first half dosage but became excellent with additional reductions. Although the "dosage dilemma" was solved for both large and small plots by the English and Cornell sprayers respectively, their active use was discontinued after a few years because companies did more testing prior to releasing experimental herbicides. The equipment also had modest usage when combinations and additives were being investigated but today the logarithmic sprayer is a museum piece.

## **2. Timing of Herbicide Applications**

From the earliest days herbicides e.g., metallic salts, were applied late postemergence. Stoddard solvent and 2,4-D continued this tradition. Researchers in the Northeast led the trend towards earlier timings, with the Rutgers group pioneering "at planting" in the late 40's. A Cornell crop scientist gave a paper at our 1948 meeting describing a "no-till" system for potatoes using 2,4-D plus dinoseb "at cracking". With the advent of EPTC in 1957 came the revolutionary "pre-plant incorporation" technique. Much of the information as to how the performance of incorporated EPTC was influenced by tillage tool, depth, soil moisture, etc. was in the Proceedings of NEWCC prior to the company publishing its extensive research conducted in its west coast laboratories. Also many northeastern states did detailed research on "at emergence" and "early post emergence" timings several years ahead of other regions. In 1961 a paper on "pre-treating" soils was the beginning of "stale seedbed" research.

## **3. Mode of Action**

In the late 40's and early 50's scientists at Beltsville and North Carolina State were among the few in the public arena who were investigating mode of action. They also were attempting to identify chemical characteristics likely to yield activity and selectivity. While significant efforts in this area were also underway in company laboratories, discoveries of major new chemistries at this time came primarily from screening massive numbers of new compounds "off the shelf" rather than from molecular designs developed by research scientists. Gradually new chemical groups appeared. Company scientists had more information to build on and a few more designed herbicides were introduced. Today, random screening is a minor source of new herbicide chemistry. Currently, University and U.S.D.A. scientists concentrate on the details of



mode of action of herbicides that have come from company laboratories, rather than on trying to invent new chemistry.

#### **4. Weed Life Cycles and Ecology**

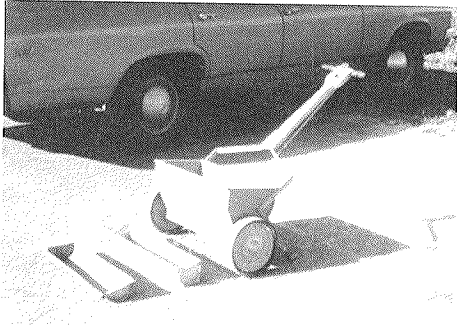
It was recognized when stoddard solvent and 2,4-D came on the scene that information on weeds biology was woefully lacking. University scientists in NEWCC decided to make an organized cooperative approach to remedy the situation. They formed a regional group and received federal funding. Weeds were selected for their importance and research on various aspects was assigned to the several participants. After a few years, the results were pooled and a special publication issued. This effort yielded bulletins on barnyardgrass, common ragweed, crabgrass, foxtail, galinsoga, horsenettle, nutsedge, purslane, quackgrass. However, administrators responsible for allocating funds for cooperative regional research in the Northeast decided in the mid-70's that this area of weed science was of low priority, and they cut off the funds. Little research on weed species, per se, has been done since.

#### **5. Formulations, Combinations, Additives, Low Dosages**

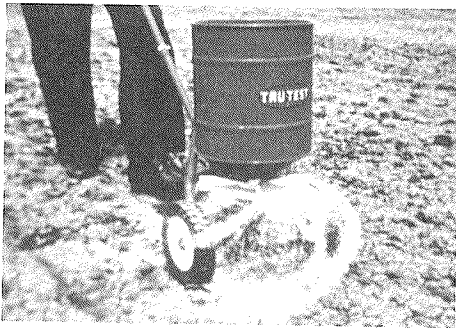
The concept of granular formulations for herbicides was introduced in 1954 by the Virginia Truck Agricultural Experiment Station. They were particularly suited to band applications at time of planting. Also they were relatively unaffected by windy conditions.

In the 60's weed scientists in the northeast were heavily involved in research on combinations, low dosages, and additives. These efforts were aimed at reducing potential damage from carryover to fall cover crops or rotational crops rather than to alleviate environmental risks. Research in these areas was not supported in concept by companies, and represents one of the few times when the two groups were at loggerheads. On the one hand University researchers were promoting low rates of two or more herbicides plus additives, whereas companies were saying increase the dosage of one herbicide but at the same time increase the interval before planting a sensitive crop.

Experience has demonstrated the merits of combinations and additives, particularly crop-oil concentrates. Companies now promote pre-packaged combinations and additives. However, the low-dosage concept has not yet been fully accepted. Environmental issues will probably play a major role in the final decision on this issue.



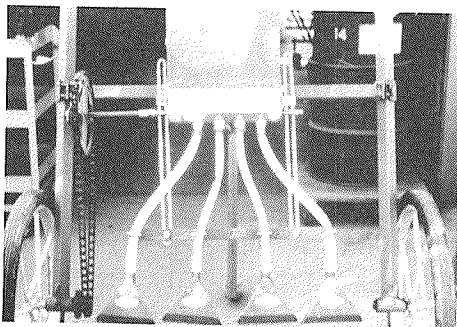
Lawn spreader and calibration pans.



Wheel driven "cyclone" spreader



3 pt hitch "Cyclone" spreader



"Gandy" row applicator

The advent of granular formulations in the mid 1950's required special equipment both for research and general use. (Photos from Senesac)



## 6. Weed Control Systems With Reduced Herbicides

Public pressure against pesticides, including herbicides over the last 15-20 years has resulted in several new concepts and trends including IPM, sustainable agriculture, best management practices, biological controls, etc. All have a basic underlying philosophy i.e., the utilization of all feasible control measures and reduced dependence on man-made pesticides. University personnel are spending considerable effort trying to modify production systems, particularly by utilizing cover and mulch crops together with modified tillage. No clearly superior system has evolved to date. A limited number of researchers are emphasizing biological controls, particularly with fungi and/or their toxic extracts as sprays to selectively kill weeds. A few promising controls, particularly for perennials, have emerged. However critics say all these do is substitute a biologically made toxicant for one which is made by man. To date bio-engineering in weed science has emphasized creating crops that are tolerant of herbicides. In contrast, the activity for crop resistance to insects, diseases, and nematodes has been significant. History will record the outcome of this area of research and debate.