BLUEBERRY WORKERS CONFERENCE 1969

DEPARTMENT OF REGIONAL ECONOMIC EXPANSION

FOREWORD

A Blueberry Workers' Conference was held at St. John's, Newfoundland on June 24, 25 and 26, 1969. The first business session was devoted to reports from the provincial delegates on lowbush blueberry situations and the future outlook with respect to production, development and research, and processing and marketing. Papers were also presented on fertilization and harvesting methods.

The second day was devoted to field trips to blueberry producing areas in East Newfoundland, while the third day consisted of the second business session, covering marketing, the ARDA blueberry program, plant breeding, and weed and insect control.

This volume contains most of the Conference papers, which have been adapted for publication.

N. A. Wiksten,
Resource Development Section,
Department of Regional Economic Expansion,

July, 1969

CONTENTS

PRODUCTION, PROCESSING, AND MARKETING OF LOWBUSH BLUEBERRIES IN QUEBEC

Gilles Pinard

The 1968 blueberry yield in Quebec was seriously affected by adverse weather conditions. Frosts at flowering time and again in July and August, and drought during fruiting, all helped to reduce the potential yield to about one-third of the previous year's production.

But in spite of these unfavorable growing conditions, about 6 million pounds of blueberries, worth approximately $1.3 million were harvested. The increase of 549,000 pounds in the harvested crop as compared with 1967 may be attributed to the very high prices paid to pickers (22¢ a pound compared with 11¢ in 1967) and also to the unusually long picking season, which lasted until the end of September.

In addition, over 2,900 persons took part in the harvest in the 22 blueberry fields established under the Federal-Provincial ARDA Agreement; and we estimate that there were over 4,000 pickers on Crown lands and private holdings.

An important step was taken last season: in view of difficulties encountered by blueberry syndicates at the second burning of their picking grounds, the Quebec Department of Agriculture and Colonization decided to place 13 oil burners at their disposal free of charge and to pay for the fuel. Unfortunately, owing to a delay in delivery of the burners, we had to postpone burning these blueberry fields until the fall.

The Quebec government also makes a rotary contact applicator available to the syndicates to help them gradually

rid blueberry fields of competing plant species.

Processing:

At most, there are scarcely five brokers in the province of Quebec who specialize in selling blueberries to the fresh fruit trade. About 6 per cent of the crop harvested in 1968 was marketed for fresh consumption, while the remaining 94 per cent went for processing.

Part of this 94 per cent of the crop is processed directly in the province by bakers and confectioners, and by the following firms: Kraft Foods, Raymond Cantin, Vachon Ltée, Old City, Heinz and a few others; but most of it is shipped outside Quebec, either fresh or frozen. We have six plants which specialize in freezing blueberries. Altogether, they can handle about 10 million pounds. Only one of them is equipped for washing and freezing by the IQF method.

The main sources of marketing difficulties are the type of container and too many middlemen. A Quebec blueberry picker can sell his fruit in a 5-gallon pail, a bushel hamper, 2-, 4-, 6- and 11-quart baskets, a container holding eight boxes, a 5-pound box, or (the most generally used) the 4" X 11" X 22" lidded wooden box. Since the picker has to make these boxes himself, the size is not always right and the weight of berries may be short. Also, the fact that this type of container is completely closed makes it easier for unscrupulous pickers to put rubbish in them and encourages careless buyers to handle them roughly.

We had made frequent visits to freezing plants to investigate complaints about foreign bodies in boxes and short weight, and have nearly always found the complaints to be justified. We made a random sampling of 150 boxes to find the average weight: the weight of berries in closed boxes ranged from 15 to 25 pounds, with an average of 19.7 pounds per box (see

Table 1).

TABLE 1

Weight of berries (pounds)	Number of boxes
15	1
16	5
17	11
18	22
19	29
20	34
21	23
22	18
23	2
24	4
25	1

TOTAL: 150 boxes
AVERAGE: 19.7 pounds/box

As the quantity paid for is 22 pounds per box, the brokers' average loss is around 10 per cent. If we want to keep and increase our blueberry trade this situation absolutely must be remedied.

Next season, we are therefore going to try gradually to replace the containers used in our province by a standard type. We have already contacted the box-makers and they have promised to submit a sample to us very soon. In addition, for the coming season, the Joint Blueberry Plan will require every broker to have a license issued by Quebec Agricultural Marketing Board before he can buy or sell blueberries.

BLUEBERRY RESEARCH IN QUEBEC

Victorin Lavoie

In 1968-69 -- following the program we set ourselves last year-- we have been working on 19 specific projects, mainly in scientific fields related to blueberry production and dealing with technical aspects of marketing.

Two projects have been completed: "Plant-soil relations in blueberry fields and jack-pine stands" and "The influence of blueberry field structure on yield". Final reports on these two projects will be submitted in the summer or fall of 1969.

In addition to the projects described in our annual report, we have set up a four-factor split-plot experiment to study water requirements, weed control, soil fertility and growth regulation. On the 450 plots of this experiment, we are studying the interactions of these factors in relation to our criteria. The report on this experiment will be made next year.

In response to a specific request, we have prepared a plan to extend some of our research projects to community blueberry fields. The plan involves replicating our experimental plots under special conditions and demonstrating useful applications of our research findings to growers. This work is being carried out in close co-operation with the provincial blueberry co-ordinator (director) who is in charge of the information and extension aspects. As far as we are concerned, these trials concern weed control and fertilization. We have made applications by the usual methods and also from the air by plane. We propose to make a comparative study of these two systems.

On the advice of the Quebec Agricultural Research Council, and at the provincial co-ordinator's request, we are starting economic and sociological studies this year. The

economic study deals with existing blueberry marketing channels and methods available to pickers, and with the chief market problems from the processors' and consumers' standpoint. After this initial survey, we shall be in a position to make a more detailed study. The sociological study is designed to determine the sociological characteristics of pickers, their attitudes to the operating set-up of blueberry fields and producers' organizations, to picking methods, time, season and sites, and to buying methods. We are also interested in their opinion of the economic importance of this crop and in the use they make of this supplementary source of income.

Last year's blueberry pollination tests were concerned with the use of honey bees and bumblebees. Our results lead us to believe that use of honey bees to increase the number of pollinating insects cannot be recommended under present conditions, for the following reasons: weather conditions during flowering time are unfavorable to the bees' activity; the presence of even dense populations of honey bees does not diminish the observed losses of developing fruit, the cost of renting and looking after the hives is too high at the present stage of blueberry production. On the other hand, increasing the number of bumblebees through domestication might be a way to solve the problem of pollination.

Our investigation of insect pests of blueberries in the Lake St. John region shows that the black army cutworm *(Actebia fennica)* did appreciable damage to the plants and flower buds in the spring of 1968. As regards the blueberry maggot *(Rhagoletis mendax)* we once again found no signs of it in the Lake St. John region.

Our work on the structure of blueberry fields leads us to believe that, in planning and organizing them, a compromise would be advisable between the yield potential of the open field and protection against frost by retaining an adequate canopy of tree growth while encouraging maximum possible production.

As regards morphology, we noted the presence of fungi in tissues dying back. Physiologically, we find that growth regulators such as gibberellic acid and 4-CPA have a marked effect on fruit-set: gibberellic acid is mainly effective at the start of flowering while 4-CPA seems to be more effective at the end of flowering.

With regard to soil fertility, only nitrogenous fertilizers appeared to give good results; application rates tested indicated that 48 to 54 lbs/acre would be more beneficial than lower rates.

Our work on weed control showed that spraying the foliage of sweetfern with a rotary contact applicator in mid-July produced 75 to 80 per cent withering. Spraying plots infested with lambkill with 2,4-D ester in the fall preceding renovation helped to bring about a considerable reduction in this weed after regeneration by burning in the following spring.

Two points stand out in connection with marketing procedure: the use of the rake for picking is recommended on equal terms with handpicking; and the blueberry freezing process is one cause of loss in quality.

In our research on plant-soil relations, plant densities and other criteria confirm our opinion that blueberry fields should be established in sandy plains and particularly on jack-pine sites. Our observations emphasize the importance of soil studies as a preliminary to location of blueberry fields. Fields now in operation do not have the same yield potential and call for critical re-appraisal. Terrain with variations in slope, where fragipan cannot occur, seems to offer good prospects for blueberry production.

Studies of mechanical picking are well under way; a rotary brush has proved very promising because of its low construction cost, great efficiency, small percentage of crushed berries, mechanical strength, and suitability for quite diffi-

cult terrain.

In closing, we should mention that our work in community blueberry fields has convinced us that the use of the rotary contact applicator is a difficult operation because of the constant need to adjust the rate of herbicide application when the stand of sweetfern is not uniform.

BLUEBERRY FLAME BURNER

Jean-Marie Fortin and Roger Benjamin

Figures 1 and 2, on the next two pages, show side and rear views of the blueberry flame burner (LP). The components are indicated in the figures by numbers, as follows:

(1) tank valve with intake tube extending to the bottom of the tank,
(2) low-pressure regulator,
(3) main line (flexible hose),
(4) distributor,
(5) lines to burners (flexible hose),
(6) free vertical acting arm,
(7) sub-frame supporting the free acting arm,
(8) spacing adjustments,
(9) hydraulic cylinder,
(10) pivot shaft,
(11) gage runner,
(12) main frame,
(13) supporting wheel,
(14) triangular frame for burner,
(15) adjustable arm for burner height adjustment,
(16) couplings,
(17) adjustable chain,
(18) lift arm.

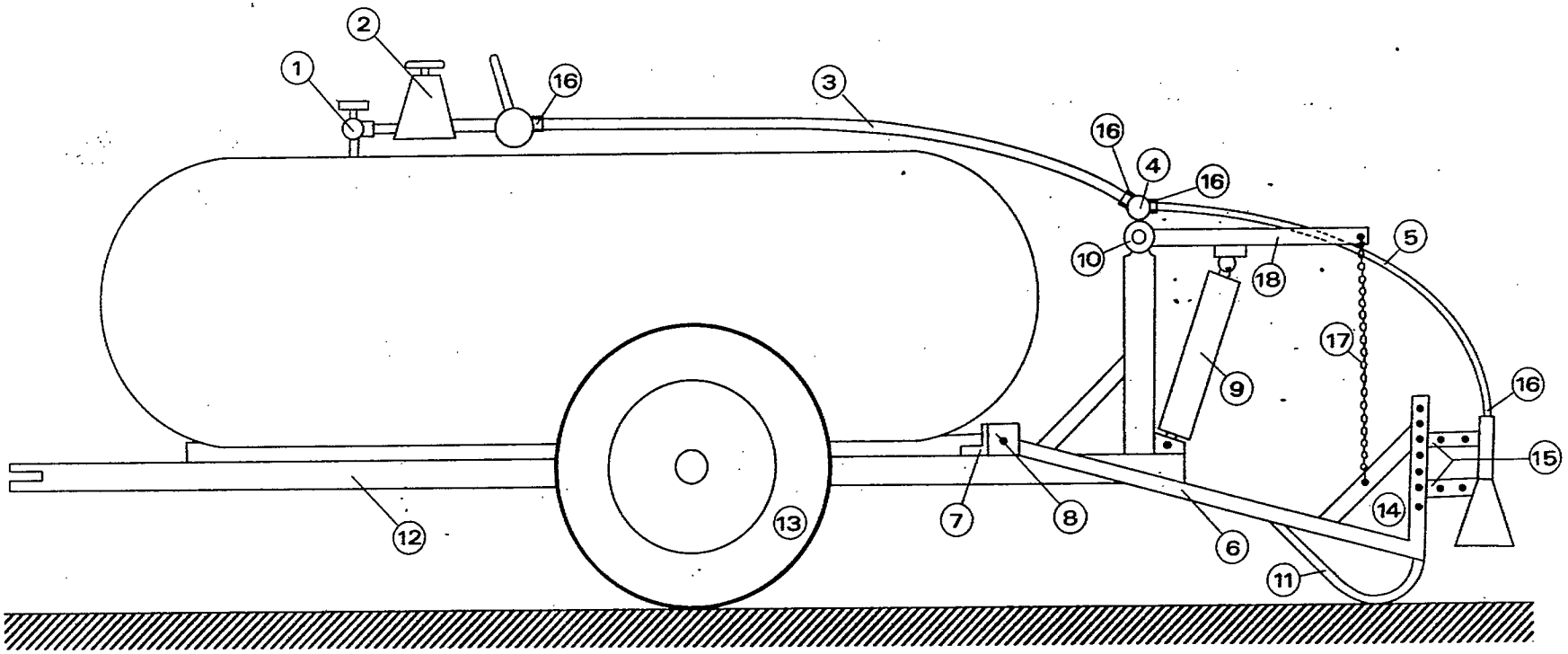

FIGURE 1 - BLUEBERRY FLAME BURNER (LP) - SIDE VIEW

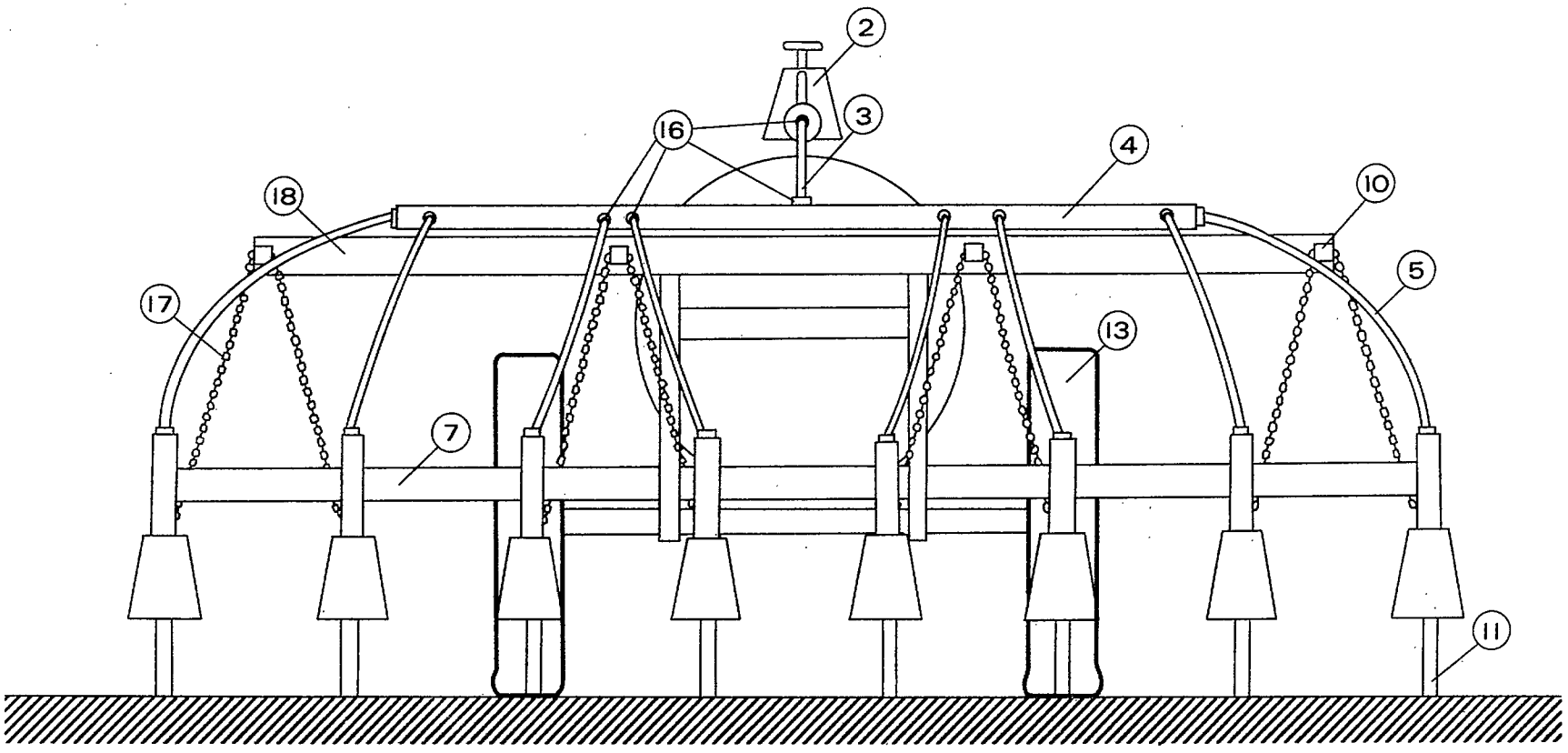

FIGURE 2 - BLUEBERRY FLAME BURNER (LP) - REAR VIEW

THE LOWBUSH BLUEBERRY INDUSTRY IN NOVA SCOTIA

Jack Sibley

Production

The average annual production of lowbush blueberries in Nova Scotia is around 7 million pounds. The total annual bearing acreage is about 8,000 acres. A gradual and continued upward trend in both acreage under cultivation and production per acre is predicted over the next few years.

It is estimated that in five years time our average annual production will be running at about 10 million pounds. Production for 1969 will be slightly lower than average due to drought conditions which prevailed last year. At the present time, we are predicting a crop of 6 million pounds.

Development and Research

Lowbush blueberry research in Nova Scotia is carried on by both the federal and provincial governments.

Federal research is centered at the research stations located at Kentville and Nappan. At Kentville, research is being carried on in the genetics, botany and ecology of the lowbush blueberry. In recent years, research work has also been done on the domestication of the native lowbush blueberry. At Nappan, research work is centred around chemical weed control and the domestication of the lowbush blueberry.

Under the Federal-Provincial ARDA Agreement, a program of applied research on the lowbush blueberry has been carried out since 1965 by the Nova Scotia government. Research on pollination, harvesting methods, marketing, weed control and domestication of the lowbush blueberry has been done under this program.

In the future, we look for continued research work at the federal research stations, as well as a continuation of some applied research programs by the provincial government. However, work cannot be continued on the present scale without some support from ARDA or some similar organization.

Processing and Marketing

Nova Scotia now boasts four large IQF freezing plants with a freezing capacity of 8 to 10 million pounds, and storage facilities for about 8 million pounds of frozen berries. This is a very healthy situation as far as the industry is concerned, for we now have adequate freezing and storing facilities to handle our average annual production.

We do not anticipate any more processing plants for blueberries in the immediate future.

The marketing of lowbush blueberries in Nova Scotia has been carried on with basically the same system for years. This system involves growers, buyers who set up collecting stations at various locations throughout the growing area, and processors who buy most of the berries from the buyers or dealers. This marketing system will probably continue unchanged for some time to come. It is also probable, however, that there will be a greater trend toward direct buying by some processors.

NOVA SCOTIA ARDA
LOWBUSH BLUEBERRY PROJECTS, 1965 - 1969

G. B. Kinsman

The Nova Scotia ARDA lowbush blueberry project started May 1, 1965 with the appointment of Jack Sibley as project leader. Grant Cameron, technician, was appointed to work out of our Kentville office and to assist Drs. Hall and Aalders, CDA Research Station, Kentville, in the select clone project. A summer student has assisted each summer.

The following projects have been studied:

- application of fertilizer,
- fungicides,
- marketing,
- depredation,
- pollination,
- Guysborough County,
- burning,
- plant propagation,
- harvest and handling,
- plant coverage,

This project has enabled the N.S. Department of Agriculture to allocate special studies and help to be applied to one of the province's native fruit crops. Information obtained by the studies has been presented to the growers, and in most cases has been used by them. The information has also been presented to blueberry workers in other areas of Canada and the United States.

The project has also enabled CDA and NSDA employees to work closely together in planning and carrying out the programs. Thus, programs could be developed more easily and implemented more quickly than they were before.

RESULTS OF STUDIES

I Fertilizer

- Nitrogen fertilizer's beneficial effect is lessened in direct proportion to the amount of weed and grass growth found in the blueberry field.

II Plant Coverage

- Selected clone plants, greenhouse grown, were established at six locations in Nova Scotia. Growth of clones has been good. Weed control evaluations have been tried and proven successful. Fruit bud counts are comparable to highbush blueberry plants.
- Techniques have now been developed to show it is economical to establish select clone fields, using a matted row system.
- One commercial-size field (3 acres) is being readied for planting in 1970.

III Rooting Selected Clonal Plants

- Evaluated two propagation systems (Solar frame and New Jersey frame) however found they were not suitable.

IV Pollination

- Rotation of hives is necessary during the bloom period if a high density level of honey bees is to be achieved.
- Very good fruit sets can be obtained where there is a high concentration of insects present for only one good "working day" at the height of the bloom period.
- Most blossoms remain receptive to pollination until the last one-third of the bloom period. Where bees were supplied for this period only, fruit sets were almost as high as the average fruit sets.

V Harvest and Handling

- Employed work-study methods to evaluate harvest and

handling of the blueberries.

- Evaluated picking pails and lug (field) boxes.
- Showed where actual berry loss during harvest ranges from 12 to 31 per cent of the berries harvested using present-style picking rake.
- Approximately 700 feet of 16 mm. film of blueberry harvesting was taken to review harvesting methods.
- Several prototype fiberglas rakes of new design were made and evaluated. New fiberglas rakes are being made commercially.

VI Burning

- Studied several systems (straw, oil, propane) of burning to see what damage might be done to the shoots by each method over a period of time. Due to the many variables it was impossible to assess any damage.

VII Guysborough County

- Worked with community leaders in four fishing communities along the Guysborough shore in helping them to establish blueberry organizations. These organizations to supervise culture, harvesting and marketing of their crops. They were assisted with cultural, harvesting and marketing methods.

VIII Depredation

- Evaluated aluminum pie plates, hung from poles, for scaring away seagulls. Method has worked well.

IX Fungicides

- Growers questioned the reason for applying fungicides and the importance of timing for blossom and twig blight control during bloom. Showed their crop losses could be seriously reduced if they followed recommendation as stipulated in the annual Blueberry Insect and Disease Guide.

X Marketing

- Evaluated shipping lowbush blueberries in 12-pint flats, pints cellophane topped, to Boston and local markets. Berries were put through a sizing machine. Buyer acceptance and grower return good.
- Evaluated several sizes of cartons for home freezer trade.
  Found 10-pound freezer carton size best.
- Showed there is a market in Nova Scotia and Boston for quality berries that are fresh, high quality and attractively packaged.

LOWBUSH BLUEBERRY RESEARCH, 1968-69: CDA RESEARCH STATION, KENTVILLE AND CDA EXPERIMENTAL FARM, NAPPAN, N.S.

L.E. Aalders, I.V. Hall and L.P. Jackson

We are happy to report a busy and productive year on lowbush blueberry research at Kentville and Nappan. Through authorization of revised project outlines, we have been given CDA approval of our lowbush blueberry research for a further five years. We now have three projects: one on the physiology, ecology and culture of the lowbush blueberry, of which Dr. Hall is leader; one on the breeding and genetics of the lowbush blueberry, of which Dr. Aalders is leader; and one on culture and weed control in both planted and native fields of lowbush blueberry, of which Mr. Jackson is leader. The three projects are all closely interrelated, and we feel that we have been working as an effective team on this facet of blueberry research. We have received ARDA support at Kentville to the extent of one year-round and one seasonal technician in 1968, and one year-round technician in 1969. We have CDA technical support to the extent of one man-year at Kentville and two and a third man-years at Nappan.

On physiology, ecology and culture, we successfully rooted some 5,266 softwood cuttings of select lowbush blueberry clones in 1968. Our percentage rooting was 83 per cent compared to 74 per cent in 1967 and 57 per cent in 1966. This indicates that we are doing a better job in looking after our material and that some changes that we have been making in equipment and techniques have been paying off. Over 4,000 of the cuttings of select clones that were rooted in 1968 were made available to various people for test plantings this spring (1969). These were distributed as follows:

Ted Pratt, N.B. Dept. of Agriculture, Fredericton, N. B.	1,000 plants
Henry Knol, grower, Cumberland County, N.S.	1,000 plants
Endel Karmo, grower, Colchester County, N.S.	800 plants
Dr. Albert MacPhee, grower, Hants County, N.S.	800 plants
Jack Sibley, N.S. Dept. of Agriculture, Truro, N.S.	500 plants
Germain Bourassa, agronome, St. Barnabé Nord, Que.	144 plants
Total distributed in spring 1969	4,244 plants

One grower has expressed an interest in propagating this year enough plants to plant somewhere in the order of 20 acres of select clones of lowbush blueberries. Over a five-year period he hopes to increase this to about 100 acres. We plan to supply him this year with as many cuttings of select clones as possible, and I believe he plans to construct a greenhouse to root and grow them. He is preparing his land this summer, and his first plants will be set to the field in the spring of 1970. We plan to help him all we can, and we certainly hope his efforts will be a commercial success.

During the past year, we have conducted research on many basic phases of physiology of the lowbush blueberry plant. These include factors affecting rooting, response to fertilizers, seed germination, low-temperature injury to blossoms, factors affecting pollen production, chilling requirements of dormant plants, methods of hardening off plants, and the identification of volatiles emitted from developing fruit. A list of our research papers on lowbush blueberry published during 1968 and

so far in 1969 is appended.

On breeding and genetics of the lowbush blueberry, we are continuing our efforts to develop, identify and prove the value of lowbush blueberry cultivars that will be sufficiently better than average field stock to justify their being planted on a commercial scale. Toward this end, we added more plants of select clones to our three established test plantings in Northern Nova Scotia in both 1968 and 1969. The number of plots in each location now stands as follows:

West Brook, Cumberland County,	Area I -	512 clones
	Area II -	358 clones
Westchester Station, Cumberland County,	Area I -	281 clones
	Area II -	232 clones
East Mines, Colchester County,	Area I -	197 clones
	Area II -	192 clones

We do not plan to add many more plants to these test plots as we feel that the clones that are now established there probably include the best and most easily propagated clones that we have available.

In 1967, we selected 16 elite clones from among 449 select clones that were fruiting at our Sheffield Farm planting. Open pollinated seeds were collected from these plants when the clones were selected, and these were grown during the winter of 1967-68 and set to the field in the spring of 1968. Many of these plants flowered this spring (1969) and we will be examining them at fruiting time this year with considerable interest. Controlled crosses were made among these elite clones in the winter of 1967-68, and several thousand hybrid seedlings were grown during 1968. A total of 4,932 of these plants were set to the field this spring (1969). Further crosses were made among these elite clones this past winter and several thousand more

hybrid seedlings are now growing in our greenhouses for planting in 1970. In addition, a randomized and replicated variety trial of the 16 elite clones was planted at our Sheffield Farm this spring.

On the project on cultural trials and weed control, we will mention here only cultural trials because Mr. Jackson is giving a separate report on weed control. Again the cultural trials are aimed at the eventual planting of lowbush blueberry fields. The trials are carried out on several soil types and under varied climatic environments in the Nappan area. For this work, we are using both seedlings and rooted cuttings of select clones. The following is a list of experiments presently underway:

(1) comparative growth of transplanted select clones and of transplanted seedling crosses of select clones,

(2) performance of started plants set in cultivated ground versus those set in unbroken sod,

(3) use of organic and asphalt mulches,

(4) comparison of methods of starting plants from stem cuttings and from seed,

(5) effects of soil amendments in the greenhouse and in the field,

(6) evaluating the phytotoxic effect of residual herbicides.

In addition, the interaction of various herbicides with many of these cultural treatments is being given very careful attention.

This brief report, we hope, indicates at least the scope of the research on lowbush blueberries, other than on weed control, that is currently being carried out by the Canada Department of Agriculture in Nova Scotia.

RESEARCH PAPERS

The following is a list of research papers on lowbush blueberry published by the Research Station, Kentville, N.S., during 1968 and so far in 1969.

1. Aalders, L. E., and I. V. Hall, 1968. The effect of depth of planting on the survival, yield, and spread of the common lowbush blueberry, *Vaccinium angustifolium* Ait. HortScience 3:72-74.

2. Bonn, Beverley, F. R. Forsyth, and I. V. Hall, 1969. A comparison of the rates of apparent photosynthesis of the cranberry and the common lowbush blueberry. Naturaliste Can. (in press).

3. Forsyth, F. R., and I. V. Hall, 1968. Note on ethylene production by flowers of *Vaccinium angustifolium* Ait. following treatments with 2-chloroethane phosphonic acid and other growth regulators. Naturaliste Can. 95:1165-1167.

4. Forsyth, F. R., and I. V. Hall, 1969. Ethylene production with accompanying respiration rates from the time of blossoming to fruit maturity in three *Vaccinium* species. Naturaliste Can. (in press).

5. Hall, I. V., and L. E. Aalders, 1968. Fruit set and berry development of lowbush blueberry as affected by temperature. Can. J. Plant Sc. 48:321-322.

6. Hall, I. V., and L. E. Aalders, 1968. The botanical composition of two barrens in Nova Scotia. Naturaliste Can. 95:393-396.

7. Hall, I. V., L. E. Aalders, and A. D. Crowe, 1969. Apical dominance in the lowbush blueberry altered by indolebutyric acid. HortScience 4 (in press).

8. Kender, W. J., I. V. Hall, L. E. Aalders, and F. R. Forsyth 1969. Stimulation of rhizome and shoot growth of the lowbush blueberry by 2-chloroethanephosphonic acid. Can. J. Plant Sc. 49:95-96.

9. Townsend, L. R. 1969. Influence of form of nitrogen and pH on growth and nutrient levels in the leaves and roots of the lowbush blueberry. Can. J. Plant Sc. 49:333-338.

10. Townsend, L. R., I. V. Hall and L. E. Aalders, 1968. Chemical composition of rhizomes and associated leaves of the lowbush blueberry. Proc. Am. Soc. Hort. Sci. 93:248-253.

DEVELOPMENT OF AN IMPROVED BLUEBERRY RAKE

Jack Sibley

During the 1964 and 1965 harvesting seasons, a study of blueberry harvesting operations in Nova Scotia was carried out by the Atlantic Region Work Study Centre of Halifax. One of the recommendations made as a result of this study was that an investigation be carried out to determine whether the blueberry rake now being used could be re-designed and constructed effectively from some other material.

Field experiments in 1966 showed that harvesting losses average around 20 per cent and that much of this loss is due to losses in the raking procedure. It was felt that an improved design could eliminate much of this loss.

Working in co-operation with Ernie Bacon, Design Engineer with the Nova Scotia Research Foundation, Halifax, a project was started in 1966 to re-design the present rake. In deciding on the basic design change which should be made, consultation was held with the Atlantic Region Work Study officers, as well as with growers and research and extension workers in the industry.

Once a basic design had been decided upon, initial experimentation with various types of plastic materials was tried. These did not prove entirely satisfactory. They were light in weight, but there was some question of their strength and durability. Finally in early July of 1967, a manufacturer came up with several prototype fiberglas rakes which seemed to have the desired toughness combined with light weight. These rakes were delivered to various progressive growers in Cumberland County who were asked to assess them and pass on their comments and suggestions.

Following this grower evaluation, a new prototype was made and tested during the 1967 harvest season. Growers were enthusiastic in their response to the new rake.

In 1968, I was contacted by Ferman LeGay of LeGay Plastics in Waverley. He expressed an interest in manufacturing the rakes, and this was followed by a meeting to discuss details of manufacturing and sales.

Eventually two dozen rakes were ordered for demonstration purposes. Mr. LeGay also received several other orders for a few rakes for evaluation, and 24 of the new fiberglas rakes were tested with several growers during the harvesting season.

Comments and opinions from the growers who tried the rakes were summarized after talking with all of the growers concerned.

In general, growers who gave the rake a good trial were pleased with it. The big problem seemed to be proper construction of the curved teeth so that they would last as long as the body of the rake.

In November of 1968, a meeting was held with researchers at the Nova Scotia Research Foundation to discuss follow-up procedures on this project. It was agreed that the design was apparently successful, and that the problem now was one of proper construction (specifically the teeth of the rake) and an economic manufacturing process.

Following this meeting, a meeting was held with Mr. LeGay. This company is now manufacturing the fiberglas rakes commercially. Our department is following up this project by educating foremen and supervisors in the use of the new rakes in the field, and the Nova Scotia Research Foundation will continue to work with Mr. LeGay on construction and manufacturing problems.

EXPERIMENTS IN CONTROLLING UNWANTED VEGETATION IN LOWBUSH BLUEBERRY FIELDS

L. P. Jackson

Our approach at Nappan, N. S., to the problems of weed control systems and methods in lowbush blueberry fields of Eastern Canada was reported in considerable detail at our meetings last year in Quebec. Since that time very few, if any, changes have taken place. This report will be mostly for information and to acquaint other workers with the highlights of our experimental weed control program at Nappan and Kentville.

Our active interest in this phase of work began in 1966 when we were asked to work along with Kentville in their program of select clone planting and propagation. Since that time we have developed and expanded our work under the general project title, "Weed Control and Cultural Improvement in Natural and Cultivated Lowbush Blueberry Fields".

We had two distinct goals when planning our first blueberry weed control experiments:

1) to find chemicals which blueberry plants would tolerate,
2) to find herbicide materials which would kill out one or more plant species in a blueberry field.

We felt that the choice of the first objective was practical because unless blueberry would show a degree of resistance to a herbicide the material would have limited usefulness in a blueberry field. This is generally true, but as we proceed with our work we are observing that, while some of the materials are quite severe on blueberry plants and the weeds and blueberry are reduced in numbers, the re-growth in the next year or two sometimes has a fairly good percentage of blueberry plants with less weeds than before treatment. The selection of rates of

materials, time of year for application and stage of growth are factors which relate to this selective killing process, we have observed. Recovery after the second year of treatment has been good and this year we are replanting some of the treated areas to test the residual toxicity of some materials.

The scope of our present work is indicated by the following list of experiments being studied at Nappan and not already mentioned in other submissions:

1. tolerance of wild blueberry to new or recently introduced herbicides,
2. rates and combinations of chemicals for weed control in selected clone plantings,
3. comparison of grass cover, clean cultivation and herbicide as cultural treatments in select clone planting,
4. growth of select clones transplanted into mulched and herbicide-treated areas of cultivated ground and undisturbed sod,
5. herbicides and rates for control of purple vetch and St. John's Wort (greenhouse),
6. herbicides applied to crop and sprout fields at four dates in the year,
7. growth and development of seedlings in four soil types (greenhouse).

No. 6 is our most intensive work and is now in its third year. Appraisal of results should be possible following the fruiting of the plants which are in the sprout phase this year. The dates for application of treatments have been chosen to correspond with times of certain physiological developments in the plants, and are:

1. immediately following fruit-set in spring, about June 15th,
2. about one month after first date, July 15,
3. immediately after fruit harvest, about September 15,
4. when leaves are matured, or have begun to fall from the plants, about October 15.

New plots are laid out each year in three replicates on a crop field and three replicates on a sprout, or new burn field. They are six feet in width and 30 feet long. A small sprayer on two bicycle wheels and carrying a six-foot boom is pushed across the plots. Spray solutions are placed in a one-gallon container and, when all couplings are connected, air pressure is pushed through the system from a small supply tank carried on the sprayer. This supply tank is held at 75 to 100 pounds pressure and air is released at about 30 pounds, through a special spring-loaded valve. The air tank is recharged from a small portable compressor, powered by a small air-cooled motor. Instant start and stop spraying is obtained by the use of a solenoid valve in the supply line and an electric switch at the hand of the operator. Nozzles have a special device for instant shut-off which practically eliminates drip at the time of shut-off. Clean water is flushed through the system before changing chemicals. This removes as much of the material as possible and reduces the likelihood of mixing two materials when changing from one to another.

We have also tested a small machine for wiping herbicides on the foliage of high growing plants. This is a very practical method and has given selective removal of plants which are above the level of the blueberry plants.

The use of granular formulations of a number of materials has proved a very effective method for applying materials to the soil without damage to foliage or drift to surrounding plants.

The effectiveness of treatment is to be appraised at least two years following application. Area counts are made before treatments are applied and again after recovery. Differences in numbers of plants at corresponding yearly intervals is to be an index of herbicidal activity.

The following briefly summarizes our thoughts on our Nappan work at this time.

1. We are encouraged by the progress being made in knowledge of herbicides that are selective for blueberry and at the same time effective in controlling one or more weed species.

2. Some biennial weeds and grasses are being controlled without great damage to the blueberry.

3. Many of the tall growing perennial weeds and bushes can be controlled by wiping the foliage with herbicides.

4. Control of the shorter growing biennial weeds is our greatest problem.

5. Herbicides can be useful in preparation of fields for transplanting started nursing stock.

NEW BRUNSWICK BLUEBERRY REPORT

E. T. Pratt

Production

The 1968 blueberry season proved disappointing to most blueberry producers in New Brunswick. Our final estimate placed our production at 1.5 million pounds for the season, with an average field price of 15¢ a pound returned to the producer. This is the lowest our production has gone in the last 30 years except in 1950, when a similar figure was recorded.

The 1968 crop failure can probably be attributed to a number of factors. In the North Shore areas, down to the Nova Scotia border, spring frosts during blossom time almost completely wiped out the crop. In more southern areas of the province, where crops were reduced from 60 to 70 per cent of normal, drought and in some cases winter kill were blamed for the poor yields.

What effect will this crop failure have on our future production? Probably very little. It may have encouraged some small growers to sell out or lease to larger growers and thus speed up the trend to fewer but larger producers. It may also have had a slight effect of slowing down development of new areas. Neither will affect our production to any extent.

What are our prospects for this year? So far field conditions look good. Little winter kill has been observed and good bloom has been experienced in most areas of the province. The bloom period is now over and no frost damage has been reported. With good weather conditions between now and harvest time, an average crop (4.5 million pounds) should be experienced. However, it is still too early to make firm predictions.

Burning conditions this spring, especially in northern New Brunswick, were far from desirable. Conditions were cold,

windy and late, thus prohibiting producers from burning their fields. This means that in 1970 our first-year crop will be slightly down in acreage.

Pilfering of blueberries in southern New Brunswick is becoming a serious problem and producers are becoming quite concerned. In an attempt to curb this practise the Charlotte County Blueberry Growers' Association is supplying uniform "No Trespassing" signs to members, and offering a $25 reward for information leading to a conviction. Snowmobiles are also creating alarm, especially when there is little snow cover to protect the blueberry shoots. Just what effect the snowmobiles have on the yield under different snow conditions is unknown.

In areas of concentrated blueberry production, especially Charlotte County, it is becoming difficult for producers to hire sufficient rakers to harvest the crop. The situation is becoming more acute each year. Many of the fields in these areas are quite rough and rocky, thus a mechanical harvester, if developed, may not solve the problem.

The ARDA project in Notre Dame des Erables has 1,200 acres cleared. Approximately 600 acres will be harvested this year. Due to the poor weather conditions, no burning was carried out this spring.

Research

The New Brunswick Department of Agriculture and Rural Development is continuing to carry out studies on blueberry production.

Weed control is one of the major problems facing a producer. This year we are continuing control trials for the bedstraw weed. Mecoprop still appears to be the best treatment, but results of last year show that a mixture of Atrazine and Paraquat have promise. This weed is becoming more widespread each year.

Hardwoods are becoming more and more prevalent in our fields. The most widespread and hardest to control is hardhack *(spiraea Tomentosa L.)*. More research on the control of hardwoods is necessary. Lambkill is also very prevalent and a better control program than is now recommended is required.

Applications of fertilizer to blueberry fields to increase yields has also received some attention. Initial trials established in 1967 certainly increased stem length, but gave no apparent increase in yields. Since fertilizer tends to stimulate competing plants more than blueberries, it appears that adequate weed control methods will be as necessary as knowing what type and amount of fertilizer to use.

This spring a fertility trial containing different rates of fertilizer with and without Simazine for grass control was established. We hope to continue this trial for a number of years to evaluate the long-term effect of fertilizer and Simazine on yield.

This year we were fortunate to obtain a number of rooted cuttings of select blueberry clones from the CDA Research Station in Kentville, N. S. These clones were planted on May 16th at two locations, Island View and Blissville. Simazine at the rate of three pounds (active) per acre was applied for grass control. These plantings will be watched with much interest.

Due to the problem of burning in northern New Brunswick from both the standpoint of weather conditions and fire hazard, research in the possibility of using chemicals for pruning is required.

Processing and Marketing

As mentioned at last year's conference, our present processing and marketing situation is as follows. Producers in northern New Brunswick sell mainly to local fish processing

plants, who freeze the berries and in turn market them to wholesale outlets in other parts of Canada or the United States. In southern New Brunswick the bulk of our production is sold direct from the field to the large processing plants in Maine. There are also a number of buyers who buy and freeze locally. Some berries also move to Nova Scotia processing plants.

Due to the short crop last year, most processors in New Brunswick were unable to obtain enough berries to meet their needs. There should be very little carry-over from last year, thus strong demands are expected. This should have a favourable effect on price.

BLUEBERRY INSECT PROBLEMS IN EASTERN CANADA

G. W. Wood

Lowbush blueberry is fortunate in being a crop which requires very little insecticidal treatment. It is not that insects generally ignore it, because careful observation will show that perhaps a hundred or more species feed on its succulent foliage, buds and fruit. Most of these species, however, either occur in relatively small numbers or otherwise cause damage which is not considered economically important.

The blueberry maggot, *Rhagoletis mendax* Curran, is the only insect which annually requires chemical treatment in New Brunswick, Nova Scotia, and Prince Edward Island. It is not present in Newfoundland and is not a problem in Quebec or farther west in Canada. The maggot matures in the ripening fruit and requires regular control treatment because of its effect on the marketability of the crop rather than on any contribution to crop loss.

The blueberry thrips, *Frankliniella vaccinii* Morgan, and a companion species *Taeniothrips vaccinophilus* Hood, are of economic importance in several fields in Charlotte County, N.B., and in Cumberland County, N.S. These thrips attack the blueberry in early spring and prevent the leaves on infested plants from unfolding naturally. The curled leaves are often wrapped about the stems and infested plants bear little, if any, fruit.

In Charlotte County, N.B., there is an abundance of climbing cutworms and geometers or inch-worms. Over 50 species have been recorded, but of these only two species, the black army cutworm, *Actebia fennica* Tausch., and the chain-dotted geometer, *Cingilia catenaria* Drury, have appeared in numbers sufficient to warrant control measures. Most of the climbing cutworms feed only at night and they frequently go undetected until considerable

damage is done. They are active in May and feed on the fruit buds and foliage. The chain-dotted geometer is a day feeder and more easily detected. The recommended method of assessing cutworm prevalence is to sweep the fields at night with an insect net.

A casebeetle, *Chlamisus cribripennis* LeConte, has been causing heavy crop losses in Cumberland County, N.S., during the past seven years. The larvae of this species are enclosed in a black case of excrement which resembles the burned head of a match. Larvae feed on foliage through July, and the adults cause further damage to the plants later in the season by feeding on the bark.

There are several other species which sometimes occur in sufficient numbers to cause some concern to the growers, but generally chemical control is not required. When chemical control is needed, the growers apply dust formulations with a power duster mounted on the back of a truck or tractor. A dust containing calcium arsenate (50%) is used for blueberry maggot, and applications are made when the fruit is starting to turn blue (about mid-July) and again about 10 days later. Dieldrin dust or DDT dust at rates of 0.5 and 1 lb. actual material per acre are recommended for thrips, and applications are made in sprout fields as soon as new shoots appear. Carbaryl dust at about 1 lb. actual material per acre is recommended for casebettle. This application is made as soon as the bloom period is over (June 30).

DEVELOPMENTS IN THE BLUEBERRY INDUSTRY OF NEWFOUNDLAND

A. F. Rayment

Blueberry production in Newfoundland has been extremely variable over the years. In the period 1952-1968 inclusive, yearly production for export (mostly frozen) varied from a low of 481,000 pounds in 1955 to a high of 2.9 million pounds in 1961, with a 17-year average of 1.6 million pounds per annum. Though no exact records are available, it is known that much larger crops were harvested at times in the 1930's. Production in the past year (1968) was extremely low (568,665 pounds) largely because the extremely cool season resulted in lower yields and delayed ripening, so that much of the crop deteriorated on the vine or was frosted before it could be harvested.

Although varying yearly weather conditions have often played a major part in causing these fluctuations, there is no doubt that other factors such as the incidence of forest fires and conditions on the labour market have also been important.

Government has recognized for some time now that regular management practices applied on privately owned "blueberry farms" may be a means of stabilizing the blueberry industry on the island and minimizing fluctuations in production. However, it has been difficult to break with the traditional pattern of public picking on common or Crown lands. The political implication of arbitrarily dividing up the traditional picking grounds is obvious. However, in recent years, certain areas remote from settlements have been neglected by public pickers and have been gradually reverting back to forest. Recently, considerable tracts of these reverting lands have been leased to an individual for improvement as a blueberry farm. The initial indication of some success in this enterprise seems to have cleared the way for

more such developments in the future.

A new problem which presents itself in the allocating of private blueberry farms is that of obtaining a burn at frequent intervals. In past government burning programs on Crown lands, they have relied entirely on a free burn, that is a burn carried by dead plant material, mostly grass and other weeds. It was soon apparent that burning by this means could not be done at the desired three-year interval for very long, and that some artificial means of burning had to be used. The province has purchased a propane burner and an oil burner, both of which have been found to be operative under average Newfoundland conditions, but the former, because of excessively high fuel costs, is not economical at present.

Due to the diversity of problems with which it is charged and the limited staff, research conducted by the federal government into blueberry problems has been curtailed in the past few years. We are at present carrying on a long-term project investigating the influence of burning frequency (every second, third and fourth year versus no burning) on the yield of berries and the ecology of the blueberry grounds. We are also maintaining plots which previously received fertilizer treatments to determine the residual effect on both fruit production and vigour of the blueberry plants. We are also carrying lines of improved clones from the Kentville Research Station for observations on their adapatability to Newfoundland conditions.

THE MARKETING OF BLUEBERRIES OR OPPORTUNITY UNLIMITED!

Phil Sheridan
North American Blueberry Council

I've been concerned with the blueberry industry for about a year and I'm far from an authority. But I have spent 25 years in advertising, promotion and public relations through radio and TV and my hobby of gourmet cooking has earned me a lifetime honorary membership in the Professional Chef's Association of America. So perhaps somewhere along the line I am qualified to speak to you - not on the raising of blueberries, but rather the marketing of them and what the North American Blueberry Council is doing to help.

According to old Daniel Webster, marketing is defined as the act of buying or selling in a market....the total activities by which the transfer of title or possession of goods is effected, including storing, shipping and selling.

Actually, marketing is far more complex than that definition because it also includes product research and development, communications, advertising, promotion, public relations plus much more. Now I'm going to give you folks credit for knowing how to store, sell and ship blueberries because that's your business. Rather, I want to explore with you the main problem of marketing in our industry and some of the ways it can be solved. And just what is this problem?

There are many growers and marketers who claim that our problem is a surplus of blueberries. Other growers and marketers say that our problem is we keep cutting each other's throats in the market place. They claim that the answer is to be found in co-operative marketing prices. To these folks I must say that I too am a great believer in co-operation.

Human nature being what it is, however, anyone who expects all of the blueberry growers and marketers to work together in the market place in perfect harmony is about as realistic as some of our psycho ceramic government economists. Psycho ceramic is another name for crackpot. I say that free and open competition is good for our industry. Not only that, but free and open competition will never get us behind bars the way price fixing and collusion will!

No, the problem with our industry isn't a surplus of blueberries or a lack of mutual co-operation. Our problem is a threefold problem similar to that which afflicted the cranberry industry until a few years ago. Our threefold problem is:

1. A lack of industry-wide communication. In other words our right hand never really knows what the left hand is doing. We market blueberries through guess-and-by-God methods that went out in other industries 30 years ago. We never sell from accurate knowledge.

2. We have not developed and expanded our markets as the volume of our product has grown. As an example, although the volume of fresh cultivated blueberries has increased sevenfold in the past 15 years, 75 per cent of that volume is still being sold along the east coast between Boston, New York, Baltimore and Washington, just as it was in 1950.

3. As our volume has expanded we have neglected research to develop new uses for our product. We have sat back content to grow blueberries without ever considering how they were going to be consumed or in what form.

I am sorry to say that in the matter of communications those of you who don't belong to NABC are like wallflowers at the senior prom. Today you're sitting on the side lines while the others are in on the action. Each week during the harvest

season an industry-wide conference call is made every Wednesday connecting all of the blueberry regions of the United States and Canada. Each area representative gives a report of the crop in his area including weather conditions, size of the crop, the volume picked, processing information and labor problems. This information is then put into a newsletter which goes into the mail within 24 hours to all member organizations (see Appendix B). This means that NABC members are constantly kept up to date on what is happening with the crop on a nationwide basis.

During the off-season from September 15th to May 15th a newsletter is sent to member organizations each month. This letter gives the government cold storage report - the latest price information concerning process fruit, as well as any other information that pertains to the work of the Council and the industry. This information service provided by the Council alone is worth more than the small membership charge of $1\frac{1}{2}$ cents per 11 pounds of berries, but communications are only the beginning of the Council's function.

The North American Blueberry Council was born just four short years ago. And right here I want to say that some lowbush blueberry people are of the opinion that NABC is oriented primarily toward cultivated blueberries. Nothing could be further from the truth. The Council couldn't ignore the lowbush side of this industry even if it wanted to, because it's the whole industry that affects supply and demand and determines prices - not just the cultivated side alone. Furthermore, the users of processed blueberries are divided into two separate schools, lowbush and cultivated and never the twain shall meet!

I learned this at the American Retail Bakers Association's Convention in Atlantic City this spring. NABC had one of the most successful booths at the convention and we offered the new sets of volume feeding recipe cards each of you received today. Over 2,000 sets of these cards were given out to interested bakers, and I had the opportunity of talking with several

hundred of these people who are large users of our product.

I learned that 60 per cent of the bakers are lowbush fruit users and they wouldn't be caught dead using cultivated berries. Some of the believers prefer lowbush berries for their superior flavor. Others like them because of price. But all users of lowbush blueberries made one point in common. They all said that lowbush blueberries will go through a donut pump without clogging it up the way cultivated berries do.

I use this story to make one important point. One of the great and crying needs for this industry is knowledge and research concerning our product and how it is used. Here is one area where we can work together, where we can co-operate through NABC, which represents 80 per cent of the industry. Let me point out some of the things we are currently doing to promote blueberries across America.

Each year the Council releases a full color page of recipes for newspapers across the country through its public relations firm. If all the lowbush people were in NABC, we could release three or four such pages on a year-round basis thanks to the additional funds that would be available.

In addition, the Council places hundreds of stories in national magazines and newspapers the year around. But we have to turn down opportunities for color covers a dozen times a year because funds are not available at the present time for such purposes.

This year my office will send out over 25,000 consumer recipe books such as the ones you received today. Unfortunately this book is three years old and badly needs to be updated with new recipes. This year the Council will distribute over 10,000 pie and muffin banners plus 5,000 other point-of-purchase materials to retail stores. These P.O.P. materials tell your story to the consumer.

This year, the Council embarked upon its first promotion in the volume feeding field to restaurants, hotels, hospitals, school cafeterias, institutions and bakeries. Why? Because today one out of every four meals in the United States is eaten out of the home. By 1975 this figure will be one out of every three meals. If our industry is to survive, it is vital that we escape from the stereotype image of blueberry pies, muffins and pancakes. We must start stimulating and motivating America's chefs to use blueberries in many different ways than they ever have before.

This is the reason why NABC exhibited in the Retail Bakers Convention this spring. This fall we have been asked to participate in the National Food Editors Conference where, thanks to NABC efforts, blueberries will be one of the featured fruits before all of the food editors in the United States and Canada. I am now working to have the President's Advisor on Consumer Affairs, Mrs. Virginia Knauer, as our speaker.

Next year NABC will participate in the National Bakers Convention, the National Restaurant Show, the National Franchise Exhibition, and the American Institutions Show. These are all part of a constantly expanding program to bring processed berries before the volume feeding trade. Now I know what they meant when I took this job and they warned me any Executive Secretary makes his living by being a slave to convention.

Another aspect of the change in American eating patterns is the matter of convenience foods. Last week in my home town of Linwood, N. J., I was in a supermarket doing some shopping and I noticed a little girl run up to her mommy with a package of cereal advertised on TV. The mother took one look at the box and snarled, "Put that back Jennifer. You have to cook that!!"

The Council has been hard at work stimulating America's food manufacturers to come out with new blueberry convenience foods and I tell you it is no accident that in today's typical

supermarket there is an average of 17 different products containing blueberries in one form or another.

At the present time, I am working on six new blueberry products and have plans to develop four more as soon as I can get to them. In the April issue of Food Product Development Magazine we placed a picture of some of these new blueberry products - blueberry applesauce, blueberry candy and blueberry liqueur. To date my office has received requests for information concerning these three products from 17 manufacturers. Just last week I sent samples of the applesauce to Duffy Mott, Musselman's, and to Seneca Apple Products Inc., and we have high hopes of getting this product market tested within a year.

At our New Jersey Blueberry Festival last week we introduced, "Cracklin' Blue," a blueberry champagne manufactured by Renault Wineries of Egg Harbor. Last month I served my blueberry liqueur to 68 food editors at the Supermarket Convention. To date, I have conducted over 50 different tests on a non-alcoholic blueberry drink similar to Welshberry. Apparently I understand booze much better than soft drinks because the alcoholic drinks are great, but the problem with a good blueberry combination drink is a long way from being solved.

I would also like to call to your attention a new blueberry product just out on the market developed by Foamat Foods of Corvallis, Oregon. This is a blueberry-flavor nugget made by removing the water from blueberry puree and pelletizing the resulting powder. In baking these pellets reconstitute into perfect nuggets of pure blueberry flavor. They don't bleed and stain muffin or cake batter and they keep indefinitely.

NABC is working closely with the Foamat people because we can see that, while the product still needs further refinement, it soon will be possible to have a truly commercial blueberry cookie, a blueberry cake mix plus a blueberry pancake and waffle mix without the bothersome little can that the housewife must now

contend with. Take home this sample and have your wife make it up into her favorite muffin recipe. You'll be surprised at the results.

These are only a few of the activities of NABC to expand our marketing horizons and promote our product to the consumer. There remains much to be done if we are to solve our problems. Let me list just a few of them briefly:

1. A test kitchen could be set up with a professional home economist to work full time on developing new recipes and new products.

2. Experiments could be conducted with Controlled Atmosphere so the fresh season of cultivated berries could be extended, thus fewer cultivated berries would find their way into processing to compete with lowbush. Also if C.A. proves successful we can then embark on an export program to Europe and the Far East by ship instead of air freight, which is too costly.

3. We could survey the country to find out why more than 50 per cent of all our product is consumed along the immediate east coast. Then we can put together regional blueberry promotions and advertising campaigns to educate the consumer in the areas where blueberries aren't popular.

4. We could survey the industry to gain some idea of who all the growers and marketers are, and how much land they currently have in blueberries, and how much more will be coming into production and when. At the present time no one really knows. In fact no one knows all the brokers who distribute our product and whether our processed fruit has complete distribution.

5. We can formulate a year-round advertising campaign to go with our public relations efforts and tell the blueberry story in much more dramatic fashion than just recipes in newspapers and magazines. Yes, these are but a few of the things that could be done if everyone joined in the effort and worked together.

Another factor seriously affecting the marketing of our product is the importation of Polish bilberries, which compete with your lowbush fruit. Last year 4½ million pounds of these berries were shipped to the United States and mixed with

your fruit. The cost? About 16½¢ per pound delivered to New York. And why not? There is no cultivation. The berries grow wild and they are picked by slave labor. No wonder they are cheap.

NABC has been much concerned with this problem and at our Spring Meeting this year we discussed means of solving it. To go to Congress and try to get a quota restriction established in this day and age, even with a Republican administration, is like asking Congress to pass a law that the public must buy blueberries at a buck a pound. While it's desirable, it's just not practical.

So my first step was to investigate whether or not bilberries had a legal right to be called blueberries. In other words, could a pie or a jar of preserves made with bilberries be legally called blueberry pie or blueberry preserves? If they couldn't, the FDA could make the users label any finished product bilbery rather than blueberry. Since the public knows nothing about bilberries this was beautiful. We don't stop bilberries from coming into the country. We just make sure that a hoe isn't called a spade. Unfortunately, our neat scheme backfired when we were informed by the USDA authorities that, since bilberries belonged to the genus *Vaccinium*, they had every right to be called blueberries. No, we couldn't be lucky enough for them to belong to the genus *Gayaluccia* or huckleberry family.

At the present time we are investigating whether or not bilberries receive any inspection from the USDA or the FDA on their arrival into the U.S. So far, after a great deal of preliminary investigation, no one seems to know. So now we are taking steps to alert authorities to make sure that, when a shipment of bilberries arrives from Poland, it will be gone over with a fine tooth comb and inspected for dirt, maggots, fungus and spores, etc. It it is discovered that this fruit is inferior in anyway, then we can have it banned completely by the USDA or we can make it mandatory that if bilberries are used in any

product - pies, preserves, topping - the product cannot be called blueberry. It must be called bilberry because it is inferior.

This is why it is vital that we maintain high standards for our own fruit. For it is a fact that the bitterness of poor quality lingers long after the sweetness of cheap price is forgotten. Of course, I realize that we have good years and bad years in blueberries, but it is also a fact that there isn't a crop grown and harvested that someone can't put up worse than anyone else and sell cheaper to get the jump on his competitors. Unfortunately, the person who does this pulls the whole industry down to his level, so that in the end he doesn't gain a thing.

You can make excuses, you can blame the weather, the packer or freezer, the shipper, even the baker who uses your fruit, as the cause of poor quality. And occasionally you might be right. But in the long run, whether you prosper in this business or fail will depend upon the quality of the fruit you offer. The same holds true for the cultivated side of the industry as well.

Yes, quality is king, and if there were a bible for blueberry growers, somewhere in it would be this passage:

> Though I sell with the tongues of men and of angles
> and have not quality,
> I am become as a braying ass and a tinkling simpleton.
> Though I advertise my product and promote it to all the
> public and have not quality,
> My product won't sell.
> Though I pack my fruit in fancy packages and though I
> offer all premiums but have not quality,
> It profiteth me nothing.
> For quality is accepted and is good.
> Quality selleth itself - seeketh not to deceive.
> Quality doeth no evil - Quality bestoweth health,
> Sustaineth high prices, fostereth further purchases,

doeth all things.
Quality never faileth.
And now abideth Advertising, Price and Quality - these three,
But the greatest of these is Quality!

So there you have it. A short glimpse into what it takes to solve our mutual problems, what steps have been taken and what steps need to be taken and how you can become involved to make the wonderful world of blueberries become opportunity unlimited.

You know, it's a funny thing. A bar of cold rolled steel, one inch in diameter and 12 feet long, costs about $6.34. If you took that bar of steel and cut it into 12 one-foot pieces, then heated them in a forge and then hammered them and shaped them and made horseshoes out of them, they would be worth about $120. Same bar of steel. It's what you did with it that made the difference. Now, if you took that same bar of steel and heat-treated it and machined it into Gillette razor blades, that $6.34 bar of steel would be worth $1,785. Now, if you took that same bar of steel and treated it and heated it and drew it out and made it into main springs for watches, do you have any idea what that bar of steel would be worth? About a quarter of a million dollars! Gentlemen, the North American Blueberry Council is like that bar of steel. You can sit back and ride our coat-tails without paying in a penny while we struggle to make horseshoes and watch springs. Or you can join in the work, share in the excitement and help to make watch springs. The choice is up to you.

APPENDIX A

The brief paper that follows, written in praise of the blueberry, was distributed by Phil Sheridan of the North American Blueberry Council at the Blueberry Workers' Conference.

THE WONDERFUL WORLD OF BLUEBERRIES

In 1616 Samuel de Champlain found Indians near Lake Huron gathering blueberries for their winter store. "After drying the berries in the sun," Champlain relates in his journal, "the Indians beat them into a powder and added this powder to parched meal to make a dish called Sautauthig." Lewis and Clark on their journey into the far Northwest Territory found Indians smoke drying blueberries to use during the winter in soups, stews and with meats. One of their first meals with these Indians consisted of venison cured by having blueberries pounded into the flesh and then smoke-dried.

Today blueberries are the third most popular non-citrus fruit in the United States and producing blueberries to meet the demands of enthusiastic fans is a multi-million dollar business. While blueberries are to be found on almost every continent in world, the United States and Canada grow more blueberries commercially than the rest of the world combined.

Blueberries are also grown commercially in Europe and have been popular there for hundreds of years. The Scotch called them "blaeberries," and today blaeberry jam is a delicacy - especially when served with scones. The English called them "hurtleberries". In America "blaeberries" became blueberries and "hurtleberries" became huckleberries. Why? No one seems to know.

We do know, however, that in ancient times blueberries were prized for their medicinal properties. In 1703 a Scotch medical book reported, "Fluxes are cured now and then by taking a spoonfull of the syrup of blaeberries." Russian women from the days of the Tartars have prescribed Chernika, a preparation of dried blueberries, for a tummyache.

But American like blueberries for their delicious

flavor and ease of preparation. Whether they are the large, luscious, cultivated highbush blueberries which are grown in North Carolina, New Jersey, Michigan and the Far North West, or the smaller, flavor-packed, lowbush blueberries which grow wild in New England and Canada, all one needs to do is simply wash and enjoy. Young America likes blueberries because they are low in calories and are packed with nutrition. A half-cup of blueberries contains only 42 calories and they rank first in vitamin A and second in food energy of all the berries. Blueberries also contain healthy amounts of vitamic C, iron and the trace of minerals.

Each year Americans consume some 150 million pounds of this succulent fruit. 50 million pounds are enjoyed fresh, right off the bush during the summer months. Another 100 million pounds is consumed all during the year in pancakes, muffins, pies, pastries, syrups, jams and preserves. In addition, each year finds new blueberry delights appearing on the market as more food manufacturers realize that John Q. Public and his family like blueberries anytime, anyplace.

If all of the blueberries grown in America in one year could be spread out in a single layer, that one layer would covera four lane highway stretching from New York to Chicago. All of the boxes of fresh berries sold in a single year would fill the Empire State Building, and enough would be left over to completely cover the Statue of Liberty!

Yet many people stoutly maintain that they prefer huckleberries. The true huckleberry, however, isn't the taste treat many believe it to be. In fact, not one person in a thousand has ever tasted a true huckleberry, because that "Old Fashioned Huckleberry Pie Like Grandma Used to Make" was probably made from lowbush blueberries!

How can you tell the difference between the two?

The huckleberry has 10 large, bony seeds which do not disappear when the berries are eaten fresh or baked in a pie. These hard seeds crack between your teeth and are most unpleasant. Blueberries, on the other hand, have 40 to 60 tiny seeds that are so soft you actually don't know they are there.

The huckleberry's chief claim to fame is that a huckleberry plant out in western Pennsylvania is the oldest living thing on earth. This one plant, covering several square miles, is estimated by botanists to be over 13,000 years old and it is one of the last surviving examples of the box huckleberry, the *Gaylussacia Brachycera*.

In addition to the huckleberry, the blueberry also has some other interesting and unlikely relatives. The cranberry, the mountain laurel, and the azalea are all cousins to the some 50 varieties of true blueberries found growing throughout the world.

The blueberry is the newest plant to be domesticated and improved. Cultivated varieties of blueberries have been in existence less than 50 years, and the public has been able to buy these big beautiful berries for less than 30 years. Today's cultivated berries are as large as marbles, and experimental varieties are now being tested that are almost as large as golf balls. But whether they are large or small, cultivated or wild, highbush or lowbush, one thing is for sure - Americans love their blueberries, anytime, anyplace, anyway!

APPENDIX B

The two crop reports in this appendix are reproduced from the Newsletter of the North American Blueberry Council. Such reports are issued weekly by the Council to its members during the harvest season.

N E W S L E T T E R

Editor: Phil Sheridan
P.O. Box 276,
Linwood, N.J. 08221

June 11, 1969

The top of the day! Here is your weekly newsletter from the Wonderful World of Blueberries.

CROP REPORT FOR JUNE 11, 1969

North Carolina - Harold Sessions Reporting

North Carolina has encountered some weather problems for the past few days in the form of showers and hail in some sections. So far the moisture has been sufficiently scattered so as not to materially affect quality, which remains good. Today marks the peak of the Carolina season and from here on out production will be on the down grade. The wet weather has resulted in some processing with a 20¢ field price typical. It is estimated that for all intents and purposes North Carolina will be out of the market by the 18th. Latest estimates put this year's crop at 90 to 100% of last year's record production. Thanks to increased quality, far better prices have resulted this year and present indications point to less processing this year than last.

New Jersey - Duke Galletta Reporting

New Jersey will be getting under way by Monday, June 16, coming into full production by Saturday, June 21. It will dovetail nicely with the declining North Carolina production. The early crop may be somewhat lighter than expected, however, despite

mummyberry and some poor pollination in the Burlington County area, the total crop will probably be 10 to 15% higher than last year.

Michigan - Pete Holbein Reporting

Michigan reports 3.2 inches of rain over the weekend. Weather today sunny, temperature 88 degrees. Northern Michigan is still 50% in bloom. There have been some reports of poor pollination and it looks like an extended season with picking taking place up until the first of November. Despite some mummyberry the crop looks about equal to last year, but the first official estimate will not be available until June 20. There is the possibility of some labor problems developing in the Michigan area. It could cut into production, but at this stage it is still too early to tell. Michigan does not anticipate picking before July 10, with heavy volume coming in about July 15.

Lowbush Report - Pete Holbein

In talking with Burleigh Crane of Jasper Wyman, Wednesday morning, he learned that the lowbush area does not expect a bumper crop. The bloom in Northern Maine is now finished with a fair crop. At present weather is dry for this time of year. Southern Maine has been badly hurt by recent frost and it looks like Maine will come in between 22 and 24 million pounds. Bear in mind, however, that with the weather dry this figure could be cut considerably.

Eastern Canada is about half in bloom and present indications are that they are suffering the effects of last year's drought.

Quebec is not in bloom as yet and it is still too early to get any estimates from that area.

Dick Drew reports from the West Coast that they will start picking June 23, which is considerably earlier than normal. The Pacific Coast crop looks to be of good quality and of about average volume.

NEW JERSEY GOVERNOR SIGNS BLUEBERRY PROCLAMATION

Today, Governor Richard Hughes of New Jersey officially signed the proclamation declaring, "July Belongs to Blueberries Month," and declaring that Smithville Inn is the Blueberry Capital of the World. This is the first step in the New Jersey blueberry promotion for the First Annual New Jersey Blueberry Festival to be held June 21, at Smithville Inn.

This will be a day-long affair which includes a Recipe Contest involving 4H Groups, Future Homemakers of America and home economic students in New Jersey high schools. First prize is a $500 scholarship. Following the Recipe Contest there will be an auction of the entries, the proceeds of which will be donated to the Atlantic County 4H and FHA members. Following a VIP Luncheon, we will hold an old-fashioned Pie-Eating Contest sponsored by the largest user of blueberries in the baking field, Mrs. Smith's Pies. The day will be climaxed by a Beauty Contest to select the 1969 New Jersey Blueberry Queen who will be crowned by the Governor of the state.

Present indications are that we will have close to 1,000 entries in the Recipe Contest and more than 10,000 people will be on hand to help promote blueberries via press, radio and TV throughout the United States.

A bow is in order for the Festival Coordinator, Al Zurowski, of Cape Associates for shepherding the proclamation through the New Jersey legislature and setting up the signing by the Governor. His efforts in publicizing the affair and in obtaining funds both from Allied Industry and from the state

have made the Festival possible.

TRANS FRESH TO CONDUCT C.A. EXPERIMENTS ON BLUEBERRIES

Following a luncheon, June 10 in Philadelphia, Hilburne Fulks of Trans Fresh Corporation has promised shipment of test equipment to New Jersey and Michigan to compare controlled atmosphere keeping qualities for blueberries against straight refrigeration. If this project comes up to expectation, there is every possibility of opening up a European export market in large volume the next two years. There is also the possibility of shipping to Hawaii and the Far East via the West Coast. We will keep you posted as to the progress of these experiments as they get under way.

That concludes this edition of our NABC Newsletter and now until next week, when we will inaugurate our first national conference call, this is Phil Sheridan your Executive Secretary reminding you, "In every business there is a constant struggle between the head and the overhead," and the top of the day to you!

N E W S L E T T E R

Editor: Phil Sheridan
P.O. Box 276
Linwood, N. J. 08221

June 19, 1969

The top of the day! Here is the latest news from the Wonderful World of Blueberries.

NATIONAL CROP REPORT FOR JUNE 18th

North Carolina - Howard Corbett Reporting

North Carolina is 85% finished picking. Weather has been very wet, causing some deterioration of quality. Most of the crop since Sunday, has been going into cans. Due to the good quality until Sunday, however, the volume of fruit processed in North Carolina will be 50% less than last year. Prices for processed fruit continues 18-20¢ field price, 24-26 finished.

New Jersey - Duke Galletta Reporting

New Jersey is now in the midst of the first Weymouth picking. Quality is excellent with opening prices at $4.80 F.O.B. packing house. New Jersey with a bumper crop in prospect is facing the most severe labor shortage in history and, unless pickers can be recruited quickly, those growers who must depend on hand picking face a real problem. As a result of the labor situation, we may see a lot more processing in New Jersey than normal.

Michigan - Pete Holbein Reporting

Michigan has had six inches of rain so far in June with temperatures ranging from 65 degrees during the day to 45

degrees at night. This cold wet weather continues to retard maturity and about 20% of the crop still in bloom in Northern Michigan will not be harvested because frost will get the berries before they can be picked. Indiana and Southern Michigan will begin picking a few berries around July 6th and the crop is expected to equal last year's. There is no processed price available from Michigan as yet.

Washington - Chuck Bond Reporting

Oregon, Washington weather has been hot and dry, but quality looks good at the moment with a slightly above normal crop anticipated. Due to the warm weather, Oregon and Washington will begin the Weymouth picking by June 23, coming into heavy volume with concords by July 4. The area has a processed field price quote of 20-22¢, 26-28 finished. The labor market seems adequate and the opening fresh price is anticipated to be $5.00 F.O.B. packing house.

British Columbia - Oscar Austring Reporting

British Columbia is also having warm, dry weather and some problems with mummyberry that may cut the crop to 90% of last year's. Estimates are that British Columbia will start picking July 10, with no volume until July 20. While greater effort will be made to sell more fresh fruit this year, British Columbia expects 85% of its crop will go into process and the field price for process remains at 20¢.

Maine - Burleigh Crane Reporting

Maine weather continues dry, but the situation still isn't critical. While Southern Maine continues to hurt from early frosts, the rest of the state will do slightly better, so a near normal crop is anticipated, if they get the needed moisture within the next 10 days.

Eastern Canada, The Maritime Provinces & Quebec - John Bragg Reporting

Nova Scotia reports the best pollination in history and a bumper crop is anticipated. The present estimate is 7 million. Moisture adequate, with normal temperatures.

Quebec has had considerable frost and cold weather, but they still have a potential crop of 10 million pounds. Quebec, however, will pick only if the price is right and the right price should be 15 to 16 cents.

Newfoundland and the rest of the Maritimes anticipate a normal crop.

FIGURES OF U. S. GOVERNMENT COLD STORAGE REPORT

The U. S. Government Cold Storage Blueberry Holdings for the month of June were a little disappointing, but they are a good 5 million pounds below last year at the same time, and we still have June to go before the new crop enters the processed market. The June figure was 16,900,000 pounds, a drop of more than 1½ million pounds from the May figure.

NABC EXECUTIVE SECRETARY TOURS CANADA

Your Executive Secretary leaves home Sunday, June 22 on a 5,000 mile trip in 7 days to tour the lowbush Canadian industry. First stop will be Quebec, where we will meet Georges Poirier in Chicantime, then to St. John's, Newfoundland to address the Canadian Lowbush Annual Meeting at the invitation of the Canadian Department of Regional Economic Expansion. The next stop will be Nova Scotia where we plan to investigate an excellent brand of blueberry wine and from there to Bangor, Maine to address the Maine Packers and Canner's Convention. Our National Conference Call and newsletter will still go on as usual thanks to our gal Friday, Judy Holland, who will watch over the office while I'm gone.

NABC OFFICE TO LARGER QUARTERS

Your Executive Secretary is moving the NABC office to larger quarters next week. Our mailing address, however, will still be the same, P. O. Box 276, Linwood, N. J. 08221. Our new phone number will be:

609-399-1559

This number will ring in both home and office, so you can call at anytime.

This concludes this edition of your NABC Newsletter, and now until next week this is Phil Sheridan, your Executive Secretary reminding you, "No enterprise can exist for itself alone. It ministers to some great need or performs some great service. If it fails in this function, it ceases to be profitable and ceases to exist!" And the top of the day to you.