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Edited under the authority of the Executive Council of the Institute.

EXAMINATIONS

Examinations for the following are conducted by the Institute:—

1. Junior Certificate in Horticulture.
2. Intermediate Certificate in Horticulture.
3. Diploma in Horticulture.
4. Seedsman's National Certificate.
5. National Certificate in Florists' Art.

Examination Papers

Sets of examination papers used at the last six examinations in horticulture are obtainable on application for sixpence per examination set.

Address all correspondence to:

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Box 1237,
Wellington.

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No. 2.

HORTICULTURAL TRAINING AND EXAMINATIONS.

Addresses:—The division of cities into postal subdivisions was designed to simplify the address of correspondence, e.g., C.1., N.W.2, etc. The number and name of the street, city and postal subdivision only should be shown in the addresses, i.e., all suburban names should be omitted, e.g., Roslyn, Halswell, Miramar, Mount Eden, etc.

Service Certificate:—It is stated in the Syllabus that evidence of service is required before the taking of each of the Institute's Horticultural Examinations. It is not necessary, therefore, that such certificate should include a testimonial as to the manner in which the candidate's duties are being carried out. It is not proposed in future, to return any such testimonial or certificate or to forward a copy thereof.

Horticultural Diaries:—The student's circular headed "Specimen Diary" ends thus: "A diary book should be of good quality. A good exercise book is suitable." The following should be added after the word "suitable" "—somewhat over 100 pages and about 8 x 10, with stiff or semi-stiff covers and rulings similar to foolscap with red-lined margin."

In the case of students for the Junior Examination submitting one week's extract from diary in March, it is desirable that this submission should be in the current year and as recent as possible. The name should always appear on the diary or diary extract and also the year.

Examiner's Comments:—One of our examiners for Special Subjects in the 1940 Examination took great pains over the examination, and it is considered that his comments on the answers would be very useful to candidates preparing for examination. It must be borne in mind, however, that no model answers are included in these comments—only certain fundamental points on which two candidates might have done better work. It is usual to publish such matter in an article in the September Journal but, unfortunately, lack of space precluded publication in the September, 1941, issue.

Each examination paper was in respect of a Special Subject in the Diploma Examination, 1940. Eight questions were given and

the candidate was asked to answer six of these, but only those questions have been quoted where the comment is considered to be helpful to candidates.

THE FLOWER GARDEN IN ALL ITS ASPECTS.

2. What kind of plants would you use and how would you arrange the planting of bedding subjects so as to provide in one bed or plot a continuity of bloom from December until April? Give at least four examples.

No. 2 Example mentioned "Godetia and French Marigold (mixed)."

Comment:—"The Godetias have to be removed before the Marigolds are planted. This is not providing a continuity of bloom."

No. 3 Example was "Petunia dwarf bedding, Ruby Gem and *Salvia splendens*."

Comment:—"The bright scarlet blooms of the *Salvia* against the ruby red (including a touch of magenta) flowers of the *Petunia* would certainly attract attention—too daring to contemplate!"

5. Give names of the following suitable for cut flowers:—

- (a) Six hardy annuals that may be sown in the open ground.
- (b) Six hardy spring, summer, and autumn flowering bulbous plants.
- (c) Six hardy spring, summer, and autumn flowering herbaceous perennials.

Answer:—(c) "Paeony, *Iris germanica*, *Delphinium*, perennial Asters, *Gypsophila* Bristol Fairy, *Chrysanthemum*.

Comment:—"Such perennials as *Scabiosa caucasica* and *Pyrethrum* James Kelway, which are amongst the best sellers, should have been given preference over *Delphiniums* and perennial Asters, which do not find a ready market as cut flowers.

6. Give four perennial climbers, other than roses, suitable for:—

- (a) Pergolas.
- (b) Trellis fences.

(a) The answer included *Ficus*.

Comment:—"One of the genus *Vitis* would be definitely better than the *Ficus*, which is more suitable for a wall."

Answer:—(b) "Jasmine, *Maurandia*, *Ipomea* Imperial Blue."

Comment:—"Better examples could have been given, e.g., *Bignonia*s and *Lonicera*s."

TREES AND SHRUBS TOGETHER WITH THEIR PROPAGATION IN USE OF HORTICULTURE.

1. Give the names of some trees most suitable for street planting in cities:—

- (a) For heavy soils.
- (b) For light soils.
- (c) For exposed situations.

Give important points to be observed when planting streets.

The answer included:—"That the trees planted are not going to interfere with overhead wires The most suitable for all purposes and most conditions are standard flowering cherries *Cerasus* and *Prunus*. *Cerasus* J. H. Veitch and *Hiyakura* and *Prunus* *Bleireiana*, *P. Moseri* and *P. Pissardi*."

(b):—" and not planted in such positions as would hinder traffic or the rooting system interfere with paths or permanent roadways."

(c) "Trees of a berrying or fruit carrying type are really dangerous as they are a temptation to children climbing after same, which would lead to accidents and the breaking of the trees."

(d) "For light soils the Scarlet Oak, *Quercus palustris*, is quite good."

(e) Although *Planes*, *Platanus orientalis*, and Silver Birch, *Betula alba*, are used considerably, they are not what I consider the best, although planes are used in exposed positions."

Comments:—(a) "To plant only those trees that would not interfere with overhead wires would restrict one's choice too much; even the upper branches of such Cherries as J. H. Veitch will, in the course of time, come into contact with overhead wires. Therefore, trees that are amenable to annual or occasional pruning can be used. *Prunus Bleireiana* and *P. Moseri* are more suitable when grown as shrubs and do not make good street trees. No mention is made of such excellent trees for a heavy soil as the several species of Ash, the Lime, the Red Oaks, the tulip tree, *Liquidambar*, etc."

(b) "Regarding hindrance to traffic, there are fairly definite rules regarding such provisions, including distance of planting from intersections. These should have been mentioned."

(c) "The chief objection to "berrying" trees is not so much the nuisance of destruction by boys who, after all, only seek those fruits that are palatable, but the danger to pedestrians of the fallen fleshy fruit on the pavement."

(d) "For light soils *Quercus palustris* is not a good choice. As the specific name "palustris" suggests, it is more suitable for wet soils."

The candidate does not mention what he would consider the best trees for such a soil, e.g., *P. pinnatifida*, *Paria*, *Cercis Siliquastrum*, *Laburnum*, *Vossii*, etc."

3. How and when should the following be propagated:—

Magnolia conspicua;

Tilia vulgaris;

Cedrus atlantica glauca;

Leptospermum Nichollsii;

Rhus typhina and the copper beech.

Comments:—"Tilia vulgaris is propagated by layers from stools; an average of fifty plants may thus be obtained annually from one stool."

“*Cedrus atlantica glauca* should be grafted on to *C. atlantica*. “The closer the affinity between stock and scion, the better the result.”

“*Rhus typhina* is propagated by root cuttings.”

4. Say how and when the following should be pruned:—

Ceanothus Veitchii;
Ceanothus Glorie de Versailles;
Forsythia intermedia;
Spiraea japonica;
Hydrangea paniculata;
Cytisus Burkwoodii.

Comments:—“*Ceanothus Veitchii* should be pruned to within a few inches of the old wood.”

“*Forsythia intermedia*. To ensure a good display of bloom each year it is necessary, immediately after flowering, to remove some old wood to encourage new growth.”

“*Spiraea japonica* should be pruned hard back in the winter.”

“*Cytisus Burkwoodii*. Although brooms should, as stated, be pruned after flowering, the term “severe pruning” is too sweeping; the bushes should not be cut back into old wood. It is this practice which so often hastens the loss of such plants.”

6. Give the names of six winter flowering shrubs; briefly describe them and the treatment each should receive in the garden.

Comment:—“Instead of mentioning such speculative shrubs as *Luculia* and *Lasiandra*, hardy subjects such as *Erica mediterranea*, *E. autumnalis*, *E. cruenta*, *E. carnea*, *Daphne mezereum* and *Mahonia aquifolium* should have been mentioned.”

It appears that candidates have tended to shape their answers to suit the particular district in which their practical experience has been gained. This is, of course, a very natural tendency and the examiner has treated it tolerantly. None the less, it should be recognized that a candidate for the Diploma should know that where, for instance, a choice of plants is called for, he should not be content with a choice to one climatic district only, unless the question indicates that he may do so.

CONVOLVULUS.

In connection with a request from the Hastings Borough Council that the question of the spread of *Convolvulus* should receive consideration, it was stated at the 1942 Conference that there are two distinct plants, i.e., the creeping or field bindweed, *Convolvulus arvensis* and the climbing *Convolvulus* or pohue, *Calystegia sepium*. It was thought that it should be ascertained definitely which plant was in question and that the matter should then be referred to District Councils for information and recommendations.

A specimen plant, for identification, forwarded from Hastings to our Honorary Botanist, Dr. H. H. Allan, was reported to be the climbing *Convolvulus* or pohue, *Calystegia sepium* and not *Convolvulus arvensis*, which is much more difficult to control, as was explained by Mr. M. J. Barnett, Christchurch, at the Conference.

The Executive Council decided, at its July meeting, to circularize District Councils and other responsible members requesting advice regarding the control of *Calystegia sepium*. It was reported at the August meeting that informative replies had been received from Parks Superintendents, Messrs. C. W. Corner, Napier, and A. W. Anderson, Timaru, and it was decided to await further replies and then submit to Dr. H. H. Allan, as Hon. Botanist, and also with a view to publication, if approved by him.

In the absence of further advices, the replies mentioned above are appended. The letter from Mr. C. W. Corner, dated the 11th August, reads:—

In reply to your letter of July 21st regarding *Calystegia sepium*, Hilgendorf, in his "Weeds of New Zealand," refers to this as being more difficult to eradicate than *Convolvulus arvensis*. I concur with him. Neither of the above should be confused with *Polygonum Convolvulus*, commonly called cornbind, bindweed, etc., which is not so difficult to cope with. Both *Convolvulus arvensis* and *Calystegia sepium* are most difficult weeds to deal with.

In Britain, I have known of land where, for probably over one hundred years, attempts have been made to eradicate this pest, but, although it has been kept under control by cultivation, cropping and permanent pastures, and by the use of gas, lime and arsenic sprays, etc., it has never been completely destroyed.

Since I have been in New Zealand, I have found the most practicable method to be continuous hoeing with the object, if possible, of never allowing the shoots to appear above the surface. With perseverance this will keep the weed in abeyance, if it does not absolutely destroy it. Before using harrows or any implement which would spread the weed, we give special treatment to any isolated patches.

I have also used arsenic pentoxide and sodium chlorate with satisfactory results. These treatments can be carried out on arable land and on areas where there is no growth but, in shrubberies,

herbaceous borders, and nurseries it is most difficult, as there is a danger of killing existing vegetation.

Undoubtedly, this pest is a serious menace to the country and, if one purchased plants from a nursery infested with the weed, judging by the alarming way it spreads, especially in sandy soils, it would not be long before gardens and hedges, etc. would be seriously menaced.

The following are the methods that I have seen adopted and that I have practised personally also:—

1. Where possible, give the land a year's fallowing.
2. Deeply trenching and picking out the roots by hand.
3. Clearing and constant hoeing, where practicable.
4. Planting only annual or biennial crops.
5. Sowing down in permanent lawns or pastures.
6. Using gas lime by spreading two to four tons per acre over the surface and allowing six months to elapse, to be followed by cultivation.
7. Using arsenic pentoxide and sodium chlorate at strengths to check weed without being injurious to the majority of vegetation and using a greater strength where not coming in contact with plant life.

I trust that the foregoing will assist in some small measure.

Mr. A. W. Anderson's letter of the 7th August is as follows:—

I have been successful in killing the big-leaved strong growing *Convolvulus*, which I always took to be *C. sepium*, by cutting it over with a scythe two or three times a year. It was growing on an old made-up bank and almost killed some young poplars, but by keeping the growth down and hand-picking round the trees, it was killed out in three or four years and has been no trouble since. I have always understood that it is quite easy to deal with if smothered so that it cannot see the sun and if all young growth is kept down. This is sometimes very difficult to do in a hedge.

WHAT IS CONVOLVULUS?

(By H. H. Allan, Honorary Botanist.)

The *Convolvulaceae* or morning-glory family contains some well-known handsome climbers and some very serious weeds. Many growers will know the California rose, the moonflowers, and the morning-glories. The weed species are often referred to merely as "convolvulus," hence much confusion has arisen as to what species is being referred to, and what methods of control should be used. As the problem has aroused much concern among our members, and much discussion at our meetings, it seems well to explain what species occur in New Zealand.

First of all, many botanists and horticulturists divide the genus *Convolvulus* into two distinct groups: those belonging to the "true" *Convolvulus*, and those separated as *Calystegia*. If a flower of *Calystegia* is examined it will be seen to possess two large leaf-like

bracts at the base, which completely enclose the calyx. In the true *Convolvulus* these bracts are either quite small, not at all concealing calyx, or they may be absent.

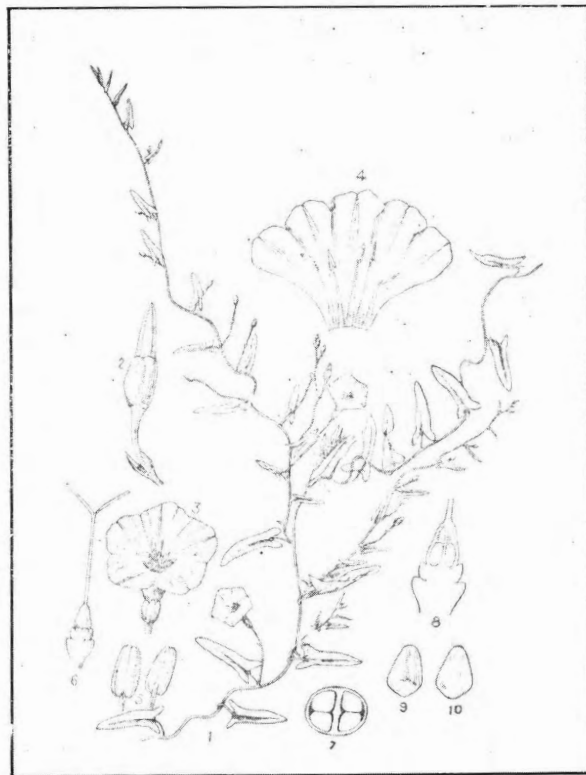
Of the true *Convolvulus*, we have *C. erubescens* and *C. arvensis*. The former is native to New Zealand and Australia, and is a small creeping plant, with the leaves more or less covered with silky hairs. It is found growing wild rather sparingly in Hawkes Bay, near Cape Palliser, and in various places in the drier areas of Marlborough, Canterbury and Otago. Its small white or pinkish flowers make it quite an attractive rock-garden plant, where there is no danger of crowding out choicer things. *C. arvensis* (usually known as bindweed or wild morning glory) is a native of the old world, and is now found in most countries and is a serious pest of arable land in all. In New Zealand it is found throughout both islands. The illustration gives a good idea of the above-ground parts, including the white flowers, which usually show pink stripes and, sometimes, a general pink flush. The obnoxious feature is the underground system of stems and roots, which so fill the soil that any crop in which it occurs is robbed of moisture and plant food, while the above-ground parts of the crop plants may be choked by the twining stems. The main "roots" are long slender cords that branch freely. Usually they form a dense mass close to the surface of the soil, while other roots descend rather deeply. Buds form at intervals along the cords and start new plants, so that even quite small detached pieces may spread the infestation.

Of *Calystegia* we have *C. marginata*, *C. soldanella*, *C. tuguriorum* and *C. sepium*. *C. marginata* is a rather rare plant of the North Auckland Peninsula, the white flowers not more than one-half inch across. *C. soldanella* (sandbine) is a common plant of coastal sandy areas with fleshy, shining leaves. When covered with its large pink flowers, it is most striking. *C. tuguriorum* (Maori convolvulus) is frequently seen as a slender climber on the margins of lowland forest, and bears numerous large white flowers. *C. sepium* (pohue or panake) is a larger stouter climber, with still larger pink or white flowers (up to three inches across). Owing to its extensive underground system this also may become a serious nuisance, especially in shrubberies and hedgerows. From November to March, it catches the eye on the margins of many pieces of lowland forest. The white flowered form of the forest is indigenous, but probably the pink-flowered form, more usually found in hedgerows and shrubberies is introduced. Some of the more handsome of these pink-flowered forms are listed in catalogues as "Rutland Beauty." Unfortunately, they have the same spreading powers and objectionable features as the white-flowered ones.

We have, then, to distinguish the low growing small flowered *C. arvensis* (bindweed) from the tall-climbing large-flowered *C. sepium* (pohue), and to avoid the indiscriminate use of the term *convolvulus* for both.



LODER CUP



BINDWEED
Convolvulus arvensis

LODER CUP.

In the late years of the last century, Mr. G. W. E. Loder, later to become Lord Wakehurst, on a visit to New Zealand, was impressed by our "incomparable flora." For many years thereafter he became an ardent collector of New Zealand shrubs and plants. A member of the Auckland Horticultural Society visiting Mr. Loder's Sussex home in 1926, remarked that he "saw more native New Zealand plants on his property than are to be found in any one place in New Zealand."

Taking advantage of the visit of representatives of the New Zealand Government to the United Kingdom in 1926, and of the fact that the Royal (English) Horticultural Society, of which he was president, was unable to do so, Mr. Loder personally presented a silver challenge cup, valued at 50 guineas, for annual competition in the Dominion. This cup was to be regarded as a challenge cup, not to be won outright, and the main object to be kept in view was the encouragement of the cultivation of native plants, especially the rarer kinds and those in danger of extinction.

Beyond thus defining its objects, Mr. Loder attached few conditions to the competition for the cup; but suggested that it should be awarded annually to the exhibitor of the best collection of native plants at the principal shows, alternately in the North and South Islands.

The cup, which is vested in the Minister of Agriculture, was entrusted to the custody of trustees consisting of "the Minister of Agriculture and two recognised botanists"; but after consideration a more representative committee was appointed consisting of the following:—

Messrs. L. Cockayne, G. W. Wright, F. R. Callaghan, of the Department of Scientific and Industrial Research, J. A. Campbell and A. H. Cockayne, of the Department of Agriculture, B. C. Aston, representative of the New Zealand Institute of Horticulture, and A. Leigh Hunt, representative of the New Zealand Forestry League.

This committee met on several occasions but, owing to the fact that it possessed no financial assets, it was induced, in the end, to arrive at a fairly restrictive basis for competition for the cup. It had in mind, however, a scheme whereby the cup would ultimately be awarded for the most meritorious piece of work done in the Dominion in any direction which had for its object the advancement of the preservation, growth and extension of knowledge of New Zealand plants. It was also intended that, in sequence, private gardens, nurseries, municipal gardens, school gardens, gardens of such bodies as racing clubs and private institutions and published work or private activities should merit the award of the cup.

The conditions laid down at that time provided for the award to be made for the best display, at annual horticultural shows in order, of living New Zealand plants growing in pots or tubs, or por-

tions of plants, taken from living specimens grown by the exhibitor.

The first competition, after many difficulties and differences of opinion had been overcome, was held under the auspices of the Auckland Horticultural Society at their Rose Show in November, 1929, and competition on the foregoing lines was carried on until 1933.

The original committee was then called together to reconsider the conditions of the competition, in view of the fact that it had been found that the previous conditions tended to confine the competition to a relatively few nurserymen, who were able to provide such an overwhelming display as to outshine all other competitors. The committee eventually agreed upon a plan of much wider conception than the first conditions, and decided that the award should be made somewhat after the manner of the Nobel Peace Prize.

The conditions of the annual award of the Loder Cup and the scope of the competition which were adopted have already been published in the October, 1935, issue of the Journal.

Under the amended conditions the award may be made to any properly nominated member of the community, who is considered by the committee to have done the most, by word or deed, towards the encouragement of the cultivation and preservation of New Zealand flora.

Briefly, the Loder Cup is vested in the Minister of Agriculture, and the administration, custody and award thereof are controlled by "The Loder Cup Committee" under the Chairmanship of the Minister of Agriculture.

The members of the Committee are not appointed as representing any particular society or organization; but purely on the basis of their qualifications to adjudicate on the relative merits of the respective competitors in the competition.

The members of the Committee were as follows:—

For the years 1934 to 1938:—J. A. Campbell (Deputy Chairman), Mrs. Knox Gilmer, Dr. H. H. Allan, B. C. Aston, A. H. Cockayne, F. R. Callaghan, A. Leigh Hunt, and T. Waugh.

For the years 1939 to 1941:—A. H. Cockayne, W. K. Dallas (Deputy Chairman), Mrs. Knox Gilmer, Dr. H. H. Allan, Dr. W. R. B. Oliver, F. R. Callaghan, A. Leigh Hunt, T. Waugh, and C. M. Smith.

LODER CUP WINNERS.

1929—At Auckland: Duncan & Davies, Ltd., New Plymouth.

1930—No competition.

1931—At Dunedin: Henry Bennett & Sons, Dunedin.

1932—At Christchurch: Henry Bennett & Sons, Dunedin.

1933—At Wellington: Thos. Waugh & Son, Wellington.

Under new conditions of award:—

1934: Viscount Bledisloe.

- 1935: Bruce Trust in perpetuation of memory of late Robert C. Bruce, Wanganui.
 1936: G. Simpson and J. Scott Thomson, Dunedin (joint winners).
 1937: Auckland Institute and Museum, in association with the name of its Botanist (Miss Lucy M. Cranwell).
 1938: Mrs. Knox Gilmer, Wellington.
 1939: William Alexander Thomson, Dunedin.
 1940: Major P. H. Johnson, Raincliff.
 1941: E. Earle Vaile, Auckland.
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PREPARING FOR THE FUTURE.

The New Zealand Horticultural Trades' Association's News Letter for August published the following interesting extract from a recent issue of the "Horticultural Advertiser":—

"Recent happenings in the world war may possibly have had a disheartening effect on some of our Trade, and may even have caused them to wonder if it is of any use bothering about the position of horticulture after the war even doubting that there will be any horticulture then, or whether all culture will be of the Nazi type and spelt "kultur." However, those of us whose faith in the ultimate victory of right over wrong know that, despite the apparently irreparable losses suffered by the United Nations since the un-announced entry of Japan into the war, the tide will eventually turn in our favour and we can look forward to a brighter future with lasting peace.

The place of horticulture in the post-war scheme of things has previously been touched upon in our columns, but we make no apology for once again broaching the subject. Its importance warrants it, and we are firmly of the opinion that to wait until the war is over before taking any action towards preparing for that happy day would be as catastrophic to the Trade as lack of preparedness for war has, up to date, been to our country as a whole.

Delay spells danger and should, therefore, not be countenanced. Action now in preparing post-war plans will find our industry in the forefront of the march of progress, whereas apathy and inaction may well mean another decade of uphill work and worry after the war.

The strong endeavours which edible horticulture is now making in order to obtain just recognition of its great value to the community should point the moral of our story very clearly. "A made road with a good foundation, provides easier travel and is capable of carrying heavier traffic, thus saving time and labour." We don't know, nor do we care, whether that is an old Chinese proverb or not, but we do know it sounds like darned good common sense to us."

EXAMINATION PAPERS, NOVEMBER, 1941.**JUNIOR EXAMINATION (SYLLABUS No. 1).****HORTICULTURAL BOTANY.**

(Time allowed—Three Hours.)

NOTE.—SIX ONLY of the following questions are to be answered, including No. 8, which is compulsory.

Use diagrams to illustrate your answers when you can do so.

Each question is of equal value unless otherwise stated.

1. Describe the form, structure and uses of the stem of any herbaceous plant.
2. Explain the difference between a fruit and a seed. Describe any seed, and the changes occurring during germination.
3. Either describe five different types of climbing plants, and the organs used; or describe five different types of seeds adapted for dispersal by animals.
4. How does water enter, travel through, and leave a plant? How would you demonstrate the path of water through the stem?
5. What are the effects of (a) excessive light, (b) excessive shade on a herbaceous plant?
6. What is the importance of carbon dioxide to a plant? How is it obtained by the plant? How is it removed from the plant?
7. Describe any flower, and state what occurs during pollination and fertilization.
8. Describe as fully and as exactly as you can the specimen supplied by the Supervisor.

JUNIOR EXAMINATION (SYLLABUS No. 1).**PRINCIPLES OF PLANT PROTECTION.**

(Time allowed—Three Hours.)

NOTE.—SIX ONLY of the following questions are to be answered.

Use diagrams where these illustrate your remarks.

Each question is of equal value unless otherwise stated.

1. Describe the practice of soil disinfection by (a) buried pipes, (b) spike harrow and (c) pan.
2. Outline the life-history of an aphid or scale insect.
3. How are virus diseases of plants perpetuated?
4. What are the main differences between summer and winter petroleum oils?
5. Give the developmental cycle of a mushroom.
6. Why is the polysulphide content of lime sulphur used as a basis for dilution?
7. Discuss the means whereby the fire-blight disease overwinters.
8. Give a spray programme for combating insects and fungi of the apple tree.

PRINCIPLES AND PRACTICE OF HORTICULTURE.

(Time allowed—Three Hours.)

NOTE.—SIX ONLY of the following questions are to be answered.

Each question is of equal value unless otherwise stated.

1. Briefly refer to the more important effects of applications of lime to soils of different kinds and conditions.
Discuss dosage, and time and method of application.
2. What is humus? What plants flourish best with little or none of it? What are the best sources of supply? What precautions are necessary in its preparation and use?
3. Write a short essay on phosphatic fertilisers and manures, and their use for horticultural crops.
4. What plants and crops are best suited to land which is over-drained and liable to dry out in summer? Give details of an economical and convenient system of irrigation for same.
5. Describe the best method of making the fungicide known as Bordeaux mixture. How does it compare with a solution of lime-sulphur concentrate as a preventive of fungous diseases?
6. Write a short essay on the pruning of hardwood plants when planting.
7. Describe the method and precautions taken when harvesting, storing and planting Narcissus, or Gladiolus bulbs.
8. Write a brief calendar of operations for the flower garden, or the vegetable garden, or the orchard, for any one particular district.

DIPLOMA EXAMINATION (SYLLABUS No. 3.)

Special Subject.—THE FLOWER GARDEN IN ALL ITS ASPECTS.

(Time allowed—Three Hours.)

NOTE.—SIX ONLY of the following questions are to be answered, including No. 8, which is compulsory. Candidates should use diagrams where considered necessary to explain their meaning.

1. Give the generic and, if possible, the specific names of twelve kinds of hardy annuals suitable for cut flowers. Briefly describe the methods you would employ in their cultivation, when you would sow them, and when you would expect them to bloom.
(Maximum points 15).
2. What mixture of grass seed would you recommend for the sowing of a permanent lawn in the flower garden?
State (a) The amount of seed recommended to sow per acre.
(b) When you would consider the most advantageous time for sowing.
(c) Whether or not you would recommend the use of any fertiliser at the time of sowing and if so what kind and in what quantity should it be used.

(Maximum points 16).

3. Describe what measures you would recommend to rid a lawn of
 - (a) Daisy and Dandelion.
 - (b) Brown Patch Disease.
 - (c) Fairy Ring Disease.

(Maximum points 16).
4. Describe by what vegetative means the following named varieties of herbaceous plants may be most successfully and economically propagated:—Paeony, Delphinium, Gypsophila Bristol Fairy, Aster amellus King George, Papaver orientale "Perry's white," Lupinus polyphyllus, Double Gerbera, Lilium testaceum, and Perpetual Carnation.
In each case describe the method and treatment employed.

(Maximum points 16).
5. Describe how you would plant and arrange a herbaceous border 9 ft. x 50 ft., the object being to provide the maximum display of bloom from the 1st September to 31st May, inclusive. Name the chief subjects you would use.

(Maximum points 18).
6. What bulbous, tuberous, or rhizomatous plants other than Narcissus, would you recommend—
 - (a) For permanently underplanting deciduous shrubs.
 - (b) For planting in the open spaces between shrubs, i.e., a semi-shaded position.
 - (c) On a warm, well drained soil in an open situation.

(Maximum points 16).
7. What kinds of Primulas would you consider most suitable for the following positions—
 - (a) The bog garden.
 - (b) The rock garden.
 - (c) For spring bedding.

(Maximum points 15).
8. You are required to instal an adequate water supply in the flower garden which has an area of approximately three acres. The main supply is situated along the northern boundary which has a frontage of five chains. What size and kinds of pipes would you use to reticulate the whole area adequately? Estimate the length of piping required. Draw a plan showing position of pipes and hose connections.

(Maximum points 20).

DIPLOMA EXAMINATION (SYLLABUS No. 3.)

Special Subject.—TREES **and** SHRUBS TOGETHER WITH THEIR
PROPAGATION AND USE IN HORTICULTURE.

(Time allowed—Three Hours.)

NOTE.—SIX ONLY of the following questions are to be answered, including No. 7, which is compulsory. Candidates should use diagrams where considered necessary to illustrate their meaning.

1. Describe by what vegetative means the following shrubs may be most successfully and economically propagated. In each case describe the method employed, when performed, and in the cases of budding and grafting, what stock would be used. *Hamamelis mollis*, *Camellia reticulata*, *Leptospermum Nichollsii*, *Cytisus Beanii*, *Davidia involuerata*, *Cryptomeria japonica elegans*, *Prunus persica fl. pl.*, *Robinia hispida* and *Fraxinus ornus*.

(Maximum points 16).

2. Give the generic and specific names of and briefly describe at least six hardy winter flowering shrubs suitable for the garden and which will bloom in the period from 1st June to 31st August, inclusive.

(Maximum points 15).

3. In order to preserve a specimen tree, how would you deal with the following injuries and defects?

- (a) Having two or more leaders and starting to split asunder at the main trunk;
- (b) Having a decayed cavity nine inches in diameter and eighteen inches deep in the main trunk;
- (c) Having the upper branches misshapen and damaged by storm.

(Maximum points 16).

4. How and when would you prune the following shrubs? Briefly describe your reasons for doing so in each case:—*Ceanothus Gloire de Versailles*, *Ceanothus Veitchii*, *Prunus Sieboldi*, *Hydrangea paniculata*, *Cydonia japonica*, *Buddleia variabilis*, *Erica Wilmoreana*, *Hebe (Veronica) hulkeana*.

(Maximum points 16).

5. Give at least six indigenous shrubs with conspicuous flowers suitable for the garden. Describe their propagation and what soil and aspect you consider most suitable for each.

(Maximum points 15).

6. Give a selection of good flowering shrubs and small trees that will provide a continuity of bloom throughout the spring and summer months, and that are suitable for furnishing a border 20 ft. x 100 ft. with a northerly aspect and where the soil is of a light nature and well drained.

(Maximum points 18).

7. What trees would you recommend for planting as a shelter belt in an exposed situation where it was desirable not only to obtain the maximum shelter but also good landscape effect? Describe how you would arrange the planting to this end. The area to be so planted is one chain wide and ten chains long.

(Maximum points 20).

8. What street trees would you recommend for the following situations and soils:—
- (a) Heavy clay soil.
 - (b) Light shingle or gravelly soil.
 - (c) Good soil and sheltered position.
 - (d) Sandy soil near the seaside.
- (Maximum points 16).

DIPLOMA EXAMINATION (SYLLABUS No. 3.)

Special Subject.—GLASSHOUSE MANAGEMENT.

(Time allowed—Three Hours.)

NOTE.—SIX ONLY of the following questions are to be answered. All questions are of equal value unless otherwise stated.

1. It is desired to have a crop of Perpetual flowering Carnations in bloom from May until September. At what time would you root the cuttings and when would you make your last "stop"? Name six sorts you would select for this work.
2. Give some data in respect of Hormone treatment from your personal experience.
3. What are the relative merits of the following fuels for glass-house heating—coal, coke and oil fuel? How are the values of these fuels assessed? What are their B.T.U. rating?
4. Using New Zealand materials only, how would you prepare potting mixture for the following orchids:—Cypripedium, Cymbidium, and Odontoglossum?
5. Detail your method of raising tuberous Begonias from seed and state size of tubers you would expect to produce at the end of the first season's growth.
6. How are the following cuttings rooted—Boronia, Daphne, Rhododendron, and Camellia? Give dates of insertion and time required to form roots.
7. What stocks are used for grafting the following plants on to—Rhododendron, Camellia reticulata, Varieties of Cupressus Lawsoniana, Junipers and Clematis?
8. Give alternative methods of sterilizing tomato soils and give reasons for your preference, if any.
9. Give the names of two books on plant propagation that you have studied and give your personal comments as to their suitability for New Zealand conditions.

INSTITUTE NOTES

PERSONAL:—Mr. J. C. McDowall, President of the Taranaki District Council, when in Wellington early in September, discussed Institute matters with the President and Dominion Secretary.

Mr. J. G. C. MacKenzie, Superintendent of Parks and Reserves, Hastings, has advised that he is entering camp on the 20th August, and will therefore not be available to act as one of the Institute's examiners in Hawkes Bay for its oral and practical tests in connection with the annual examinations. Mr. MacKenzie has been thanked for his services, in this direction, in the past and for assistance in many other ways to the Institute. It will be remembered that he acted capably as Secretary of National Horticultural Week, 1942, including the National Flower Show, which was abandoned owing to the war situation.

Mr. C. W. Corner, Superintendent of Parks, Gardens, and Reserves, Napier, advises that Mr. Dugald C. MacKenzie, N.D.H. (N.Z.), formerly of Christchurch and Kew Gardens, has joined his staff.

CENTENNIAL MEMORIAL PARK:—Mr. W. Goodfellow, of Auckland has, presented 174 acres of native bush, including some fine kauris, as an addition to Centennial Memorial Park. On behalf of the Institute and its Executive Council, appreciation of this generous gift has been conveyed to the donor.

PLANT RECORDING:—In connection with an application for the recording of a new variety, it has been decided by the Executive Council that each application shall be referred to the Horticulture Division, Department of Agriculture, for observation and report before recording can be considered.

INCREASED PRODUCTION:—A report on Seed Growing for Patriotic Societies at Napier and Hastings has been received from Mr. C. W. Corner, Napier. The report mentions that Napier will have approximately £1000 of produce sales. Hastings has about the same amount from its seed cropping and a similar amount from production of medicinal herbs. The report also mentions assistance to the Army with arrangements for growing its own vegetables.

POTATOES:—Mr. J. C. McDowall, B.Sc., Taranaki District President of the Royal New Zealand Institute of Horticulture, gave the following advice, when in Wellington recently, regarding the propagation of potatoes, and this has been circulated to newspapers:—“Now that table potatoes have been liberated for seed purposes, there comes the question of how best to propagate to get the largest crop possible. For crops cultivated at military camps or by the home grower, the following method is recommended. The method is not suitable for large scale production:—“(1) Select sound seed. (2) Remove each eye with not more than one square inch of skin, about one-eighth inch thick, attached. (3) Place these eyes on damp

river sand or very well washed sea sand in a shallow box. (4) Cover lightly with sand and stand box in warm moist place. (5) After about a week, when root development is sufficient, plant out in a permanent position with about three sets in each group. Normal cultivation then follows. Plants propagated in this way are more virile than those from sets with a large piece of potato attached. The balance of the potato, from which all the eyes have been removed, may, of course, be used for food."

CONDOLENCE:—At the August meeting of the Executive Council, it was reported that a letter of condolence had been sent to the widow and family of William Robertson, recently retired Under-Secretary for Lands and Survey, who had always been particularly helpful towards the preservation of our national and scenic reserves.

On the motion of the President, condolence was also directed to be conveyed to Mrs. E. J. Righton, York Bay, Wellington, on the death of her husband, who had been a prominent horticulturist and lover of our native flora. His garden and estate were always open to garden and nature lovers.

The President stated, at the September meeting of the Executive Council, that advice had just been received from Mr. J. C. McDowall, New Plymouth, of the death of Dr. W. M. Thomson, Hawera, Taranaki Vice-President of the Institute, on the 13th September. He was a lover of our native flora, a keen horticulturist interested in hybridization, particularly of the smaller daffodils, and a welcome contributor to the Institute's Journal. Condolence was directed to be conveyed to his widow and family.

ARBOR DAY, 1942.

The date fixed for Arbor Day this year, by the Hon. Minister of Internal Affairs, was Wednesday, 6th August, 1942, and the usual circular was forwarded by his Department to all local and other interested bodies. The following summary of observances of Arbor Day throughout the Dominion may be of interest. War conditions have, of course, materially affected the usual observance:—

ASEBURTON:—Twenty-three *Prunus subhirtella* were planted along West Street.

DUNEDIN:—2500 young Pines were planted at Mount Cargill as an addition to a plantation on the Education Board reserve there. The work was carried out by pupils from the intermediate schools and from the upper standards of the Mornington, Maori Hill and High Street Schools. Mr. M. R. Skipworth, Superintendent of Reserves, supervised the planting.

LEVIN:—In association with the staff and pupils of the Levin School, the Native Flora Club assisted in adding further to the School's collection of native trees and shrubs by planting a further 24 specimens of native flora donated by the Education Department.

MASTERTON:—The first trees for the projected Native Plant Museum were planted at the West School. A Native Plant Club is being formed at the school and each tree or shrub planted is to be the special care of one child.

NELSON:—The official planting of the Centennial Tree, a Copper Beech, presented by the Early Settlers' Association, was made in Church Hill by the Mayor, Mr. E. R. Neale. Trees and shrubs were planted by the pupils at Nelson Central, Hampden Street, and Auckland Point Schools. Mr. A. White, Superintendent of City Reserves, supervised the plantings. The Nelson Colleges were observing Arbor Day in the following week. At the Boys' College eighty trees and shrubs were to be planted along the new Terrace Drive, and Silver Birch trees and a Copper Beech were to be planted at the Girls' College.

NEW PLYMOUTH:—At Vogeltown School, a kauri and three other native trees were planted and Mr. V. C. Davies gave a talk to the school children present. Two native trees, the gift of the Vogeltown School, were planted at the West End School, and Mr. F. Parker and the headmaster addressed the children. The Central School was to hold its ceremony later.

OPUNAKE:—Trees and shrubs were planted at the Opunake District High School. An address was given by Mr. D. G. Maxwell, Rahotu, who also demonstrated the planting of trees.

TEMUKA:—Seven different coloured Lawsonianas, the gift of Mrs. A. Harrison, were planted in the Domain. Eighty trees and shrubs were planted in the grounds of the Primary Department of the Temuka District High School by the pupils of Form I and Form II.

WAIHI:—At the Children's Playing Area at Waihi Beach, members of the Women's Institute, in conjunction with the Headmaster of the Beach School and the school children, arranged for the planting of twelve pohutukawas for beautification and shelter.

WELLINGTON:—At Central Park, Wellington, the Wellington City Council's official Arbor Day planting was attended by His Excellency the Governor-General, Sir Cyril Newall, and Lady Newall. The Mayor presided, and trees were planted by their Excellencies, the Mayor and Mayoress, Mr. J. W. Heenan for Minister of Internal Affairs, the United States Minister Brigadier-General Hurley, the United Kingdom High Commissioner Sir Harry Batterbee, the High Commissioner for Canada Dr. W. A. Riddell, the President of the Institute, Mr. Hope B. Gibbons, of the Wellington Horticultural Society, Mrs. Knox Gilmer, and of the Wellington Beautifying Society, Mr. H. S. B. Fletcher, etc.

The Mayor attended a planting of kowhais made at Izard Memorial Park, Wadestown, under the auspices of the Wellington Beautifying Society, the Forest and Bird Protection Society of New Zealand, and the Wadestown Cottage Garden and Beautifying Society. The trees were donated by the latter Society, Mrs. A. J. Du Pont and Miss M. Cooper. At Wellington College, a pohutukawa was planted by Mr. L. W. McKenzie, a member of the Board of Governors, after an address to the pupils by the headmaster, Mr. W. A. Armour.

Royal New Zealand Institute of Horticulture (Incorporated.)

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Examinations:

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