ANDREW S. FULLER

THE NUT CULTURIST

Andrew S. Fuller

The Nut Culturist

A Treatise on Propogation, Planting, and Cultivation of Nut Bearing Trees and Shrubs Adapted to the Climate of the United States

EAN 8596547361794

DigiCat, 2022
Contact: DigiCat@okpublishing.info

Table of Contents

SENT FREE ON APPLICATION.

DESCRIPTIVE CATALOGUE

RURAL BOOKS,

PUBLISHERS AND IMPORTERS

ORANGE JUDD COMPANY,

52 & 54 Lafayette Place, New York.

STANDARD BOOKS.

BY ORANGE JUDD COMPANY

PREFACE

Table of Contents

Believing that the time is opportune for making an effort to cultivate all kinds of edible and otherwise useful nut-bearing trees and shrubs adapted to the soil and climate of the United States, thereby inaugurating a great, permanent and far-reaching industry, the following pages have been penned, and with the hope of encouraging and aiding the farmer to increase his income and enjoyments, without, to any appreciable extent, adding to his expenses or labors. With this idea in mind, I have not advised the general planting of nut orchards on land adapted to the production of grain and other indispensable farm crops, but mainly as roadside trees and where desired for shade, shelter and ornament, being confident that when all such positions are occupied with choice nut-bearing trees, to the exclusion of those yielding nothing of intrinsic value, there will have been added many millions of dollars to the wealth of the country, as well as a vast store of edible and delicious food.

This work has not been written for the edification, or the special approbation, of scientific botanists, but for those who, in the opinion of the writer, are most likely to profit by a treatise of this kind. Unfamiliar terms have been omitted wherever simple common words would answer equally as well in conveying the intended information. There being no work of this kind published in this country that would serve

as a guide, I have been compelled to formulate a plan of my own, and to describe all the newer varieties from the best specimens obtainable, and these may not, in all cases, have been perfect. Under such circumstances, this work must necessarily be incomplete, and especially where the possessors of claimed-to-be new and valuable varieties have either refused or failed to give any information in regard to them. On the contrary, however, I must acknowledge my indebtedness to many correspondents, who have so generously placed specimens of both trees and nuts of rare new varieties in my hands for testing and describing, as well as assisting me in tracing their history and origin.

That this treatise may become the pioneer of many other and better works on nut culture is the sincere wish of

THE AUTHOR.

RIDGEWOOD, N. J., 1896.

CHAPTER I.

Table of Contents

INTRODUCTION.

Table of Contents

No special amount of prophetic acumen is required to foresee that the time will soon come when the people of this country must necessarily place a much higher value upon all kinds of food than they do at present, or have done in the past. In this we are pre-supposing that in the natural course of events, our population will continue to increase in nearly the same ratio it has since we assumed the responsibilities of an independent nation.

The very existence of animal life on this planet depends upon the quantity and quality of available food, and while some sentimentalists may assume to ignore and even attempt to deprecate the animal desires of their race, nature compels us to recognize the fact that there can be no fire without fuel, and the great and useful intellectual powers of man are the emanations of the animal tissues of a well-nourished brain. The brawny arm that rends the rock and hurls the fragments aside, gets its power through the same channel and from the same source as those of other members of society, whatever the nature of their calling; for mankind is built upon one universal and general plan, varied though it may be in some of the minor details of construction. We certainly have no cause to fear that the theories of Malthus, in regard to the overpopulation of the earth as a whole, will ever be verified in the experience of

the human race, because with necessity comes industry, also the inventions of devices to enable us to avoid just such dangers, and if these fail to keep pace with our wants and needs, wars, earthquakes, drouths, floods, and contagious, epidemic and other diseases, become the weapons which nature employs to prevent overpopulation. But we cannot deny that nature does sometimes encourage or permit a somewhat redundant population in certain favorable countries and localities, and then follows a struggle for existence, and food becomes the paramount object in life. To ward off danger of this kind and keep the supply in excess of the demand, is a problem which should seriously engage the attention of every one who takes the least interest in the general welfare of his countrymen, even though the day of want or scarcity of food may be very far distant.

Among the various sources of acceptable and nutritious food products heretofore almost entirely neglected in this country, the edible nuts stand preëminently and conspicuously in the foreground, awaiting the skill and attention of all who seek pleasure and profit—to be derived from the products of the soil. For many centuries these nuts have held a prominent position among the desirable and valuable food products of various European and Oriental countries; not only because they were important and almost indispensable in making up the household supplies of all classes of the people, but often because available for filling a depleted purse, and the thing needful for this purpose has, in the main, been received from far-distant nations, who through indifference and neglect failed to provide

themselves with such a simple and valuable article as the edible nuts.

Much as we may boast of our immense natural resources and advantages, we have not, as yet, availed ourselves of one-half of those we possess, and the remainder is still awaiting our attention. We also neglect to avail ourselves of the many superior domestic traits and practices of the foreign nations with whom we are in constant communication. It may be that the absence of incentives has made us careless and indifferent in regard to a day of need, which in all probability will come to us sooner or later; but whatever the cause, the fact remains that we have been spending millions annually on worthless articles and sentimental problems and projects, which have brought us neither riches nor honor; in truth, to use a homely phrase, we have been following the bellwether in nearly all of our rural affairs and pursuits. As a natural result we are spending millions for imported articles of everyday use which might easily and with large profit be produced at home, and in many instances the most humiliating part of the transaction is that we send our money to people who do not purchase any of our productions and almost ignore us in commercial matters. I am not referring to those products ill-adapted to our climate, nor to those which, owing to scarcity and high price of labor, we are unable to produce profitably, but to such nuts as the almond, walnut and chestnut, which we can raise as readily as peaches, apples and pears. There certainly can be no excuse for the neglect of such nut trees on the score of cost of labor in propagation and planting, because our streets and highways are lined and shaded with

equally as expensive kinds, although they are absolutely worthless for any other purpose than shade or shelter, yielding nothing in the way of food for either man or beast. Can any one invent a reasonable excuse for planting miles and miles of roadside trees of such kinds as elm, maple, ash, willow, cottonwood, and a hundred other similar kinds, where shellbark hickory, chestnut, walnut, pecan and butternut would thrive just as well, cost no more, and yet yield bushels of delicious and highly prized nuts, and this annually or in alternate years, continuing and increasing in productiveness for one, two or more centuries. Aside from the intrinsic value of such trees, they are, in the way of ornament, just as beautiful as, and in many instances much superior to those yielding nothing in the way of food except, perhaps, something for noxious insects.

I am not attempting to pose as the one wise man engaged in rural affairs, but am merely recounting my personal observation and experience, having in my younger days taken the advice of my elders, and at a time when a hint of the future value of nut trees would have been worth more than a paid-up life insurance policy. But as the hint was not given, I selected for roadside trees ash, maples, tulip, magnolias, and other popular kinds, all of which thrived, and by the time they were twenty years old began to be admired for their beauty, although their roots were spreading into the adjoining field, robbing the soil of the nutriment required for less vigorous-growing plants. Later, however, the discovery was made that I was paying very dearly for a crop of leaves and sentiment, neither of which was salable or available for filling one's purse. When thirty

years of age the very best of my roadside trees were probably worth two dollars each for firewood, or one dollar more than the nurseryman's price at the time of planting. The greater part of these trees, however, have since been cremated, a few being left as reminders of the misdirected labors of youth and inexperience.

In this matter of following a leader in tree-planting along the highways, it appears to be a predominant trait of our rural population and as old as the settlement of this country, for nowhere is it more pronounced than in the New England States, where the American elms attracted the attention of the Pilgrims and their contemporaries and descendants, and even continued down to the present day. No one will deny that the American elm is a noble tree in appearance, is easily transplanted and of rapid growth, and yet it is one of the most worthless for any economic purpose. It may be that its worthlessness for other purposes made it all the more acceptable for streets and roadsides, the better kinds being reserved for firewood, fencing, furniture, and the manufacture of agricultural and other implements. But whatever the cause or object, the elm became the one tree generally selected for planting in parks, villages, cities, and along roadsides in the country, not only in the older but in many of the newer States. From present indications, however, the glory of this much over-praised tree is on the wane, for the imported elm-leaf beetle (*Galeruca calmariensis*) is slowly but surely spreading over the country, defoliating the elms of all species and varieties, and it is a question whether we should bless this insect for the work it is doing or look upon it as a pest. Perhaps future

generations will sing pæons in its praise, and they certainly will have reasons for rejoicing if better and more useful kinds are planted in the places now occupied by the worthless elms.

In other localities some pioneer or leader in roadside ornamentation selected or recommended some species of maple, linden, catalpa, poplar or willow, but it made little or no difference as to kind, because, as a rule, all his neighbors followed without a thought or question in regard to adaptation to soil, climate, or fitness in the local or surrounding scenery, or of its future economic value. The result of this want of taste and forethought may be seen in whatever direction one travels throughout the older and more thickly settled portions of this country.

Had the early settlers of the New England States planted shellbark hickories, or even the native chestnut, in place of the American elm, they would not only have had equally as beautiful trees for shade and ornament, but the nutritious nuts would scarcely have failed to bring bright cheer to many a household and money to fill oft-depleted purses, while their descendants would have blessed them for their forethought. Of course there are other valuable kinds of nuts which thrive over the greater part of the New England States, but I refer only to the two, which were so abundant in the forests that one or both could have been obtained for the mere cost of transplanting. But it is not fair to prate about the remissness and follies of our ancestors, unless we can show by our works that wisdom has come down to us through their experience.

What is true of the New England is equally true of all the older States, and is rapidly becoming so in many of the newer, little attention being paid to the intrinsic value of the wood or the product of the trees planted along the highways. There are also millions of acres of wild lands not suitable for cultivation, but well adapted to the growth of trees, whether of the nut-bearing or other kinds. But for the present I will omit further reference to the planting of nut trees except on the line of the highways, just where other kinds have long been in vogue and are still being cultivated for shade and ornament,—with no thought, perhaps, on the part of the planter, that both could be obtained in the nut trees, with something of more intrinsic value added. The nut trees which grow to a large size are as well adapted for planting along roadsides, in the open country, as other kinds that yield nothing in the way of food for either man or beast. They are also fully as beautiful in form and foliage, and in many instances far superior, to the kinds often selected for such purposes.

The only objection I have heard of as being urged against planting fruit and nut trees along the highway is that they tempt boys and girls—as well as persons of larger growth—to become trespassers; but this only applies to where there is such a scarcity that the quantity taken perceptibly lessens the total crop. But where there is an abundance, either the temptation to trespass disappears, or we fail to recognize our loss. As we cannot very well dispense with the small boy and his sister, I am in favor of providing them bountifully with all the good things that climate and circumstance will

afford. It is a truism that conscience is never strengthened by an empty stomach.

A mile, in this country, is 5280 feet, and if trees are set 40 feet apart—which is allowing sufficient room for them to grow during an ordinary lifetime—we get 133 per mile in a single row; but where the roads are three to four rods wide, two rows may be planted, one on each side, or 266 per mile. With such kinds as the Persian walnut and American and foreign chestnuts, we can safely estimate the crop, when the trees are twenty years old, at a half bushel per tree, or 66 bushels for a single row, and 133 for a double row per mile. With grafted trees of either kind we may count on double the quantity named, presuming, of course, that the trees are given proper care. But to be on the safe side, let us keep our estimate down to the half-bushel mark per tree, and with this crop, at the moderate price of four dollars per bushel, we would get $264 from the crop on a single row, and double this sum, or $528, for the crop on a double row—with a fair assurance that the yield would increase steadily for the next hundred years or more; while the cost of gathering and marketing the nuts is no greater, and in many instances much less than that of the ordinary grain crops. At the expiration of the first half century, one-half of the trees may be removed, if they begin to crowd, and the timber used for whatever purpose it may best be adapted. The remaining trees would probably improve, on account of having more room for development.

There has been a steady increase in the demand, and a corresponding advance in the price of all kinds of edible nuts, during the past three or four decades, and this is likely

to continue for many years to come, because consumers are increasing far more rapidly than producers; besides, the forests, which have long been the only source of supply of the native kinds, are rapidly disappearing, while there has not been, as yet, any special effort to make good the loss, by replanting or otherwise. The dealers in such articles in our larger cities assure me that the demand for our best kinds of edible nuts is far in excess of the supply, and yet not one housewife or cook in a thousand in this country has ever attempted to use nuts of any kind in the preparation of meats and other dishes for the table, as is so generally practiced in European and Oriental countries.

The question may be asked, if the demand is sufficient to warrant the planting of the hardy nut trees extensively along our highways or elsewhere. In answer to such a question it may be said that we not only consume all of the edible nuts raised in this country, but import millions of pounds annually of the very kinds which thrive here as well as in any other part of the world.

I have before me the records of our imports from the year 1790 to 1894, but as I purpose dealing more with the present and future than with the distant past, I will refer here only to the statistics of the four years of the present decade, leaving out all reference to the tropical nuts, which are not supposed to be adapted to our climate.

Of almonds, not shelled, and on which there is a protective duty of three cents per pound, we imported from 1890 to the close of 1893, 12,443,895 pounds, valued at $1,100,477.65. Of almonds, shelled, on which the duty is now five cents, we imported 1,326,633 pounds. The total

value of both kinds for the four years, amounted to $1,716,277.32. Whether this high protective duty is to remain or not is uncertain, but it is quite evident that it has had very little effect in stimulating the cultivation of this nut except in circumscribed localities on the Pacific coast.

Of filberts and walnuts, not shelled, and with a duty of two cents per pound, we imported during the same years from eleven to fifteen million pounds annually, or a total for the four years of 54,526,181 pounds, and in addition about two million pounds of the shelled kernels, on which the duty was six cents (now four) per pound. The total value of these importations amounted to $3,176,085.34.

I do not find the European chestnut mentioned in any list of imports, although an immense quantity must be received from France, Italy and Spain every year, and they are probably imported under the head of miscellaneous nuts, not specially provided for, and upon which the duty was two cents per pound in 1890-'91, but was later reduced to one and a half cents.

Under the head "miscellaneous nuts," or all other shelled and unshelled "not specially provided for," there was imported during the period named 6,442,908 pounds, valued at $235,976.05. The total for all kinds of edible nuts imported was $7,124,575.82. These figures are sufficient to prove that we are neglecting an opportunity to largely engage in and extend a most important and profitable industry. It is true that in the Southern States considerable attention has been given, of late, to the preservation of the old pecan nut trees and the planting of young stock, but it will be many years before the increase from this source can

overtake the ever-increasing demand for this delicious native nut. Californians are also making an effort to raise several foreign varieties of edible nuts on a somewhat extensive scale, but all these widely scattered experiments are mere drops in the ocean of our wants. Under such conditions I ask, in all seriousness, if it is not about time that our farmers and rural population generally began to count their worthless and unproductive possessions, in the form of roadside and other shade trees—which have probably cost fully as much to secure, plant and care for during the few or many years since they were set out, as would have been expended upon the most beautiful and valuable nut-bearing kinds. If our ancestors were at fault in the selection of trees for planting, we need not expect that posterity will excuse us for continuing and repeating their folly, especially when our dear-bought experience should teach us better.

At the present time there might be some difficulty in procuring, at the nurseries, a choice selection of nut trees in any considerable quantity, suited to roadside planting, because heretofore there has been little demand for such stock; and nurserymen are only human, and conduct their establishments on business principles, propagating the kind of trees in greatest demand, regardless of their intrinsic or future value to purchasers. They will also continue producing such stock just so long as the demand will warrant it, and further, it is but natural that they should sometimes recommend and advise their customers to purchase worthless, and even pestiferous kinds, such as the ailanthus and white poplar, because the profits in raising these trees are large and there is little danger of loss in

transplanting. But if purchasers will insist on having better kinds and refuse to accept any other, they will soon be accommodated; and if not, then let everyone who owns a plot of ground become his own propagator of trees. It is not beyond the ability of any moderately intelligent man (or woman, for that matter) to raise nut trees, and as readily as one could potatoes or corn.

Where farmers want a row of trees along the roadside, to be utilized for line fence posts, they cannot possibly find any kinds better adapted for this purpose than chestnut, walnut and hickory; and these will give just as dense a shade, and look as well—besides, in a few years they may yield enough to pay the taxes on the entire farm, the crop increasing in amount and value not only during the lifetime of the planter, but that of many generations of his descendants.

This appeal to the good sense of our rural population is made in all sincerity and with the hope that it will be heeded by every man who has a spark of patriotism in his soul, and who dares show it in his labors, and by setting up a few milestones in the form of nut-bearing trees along the roadsides—if for no other purpose than the present pleasure of anticipating the gratification such monuments will afford the many who are certain to pass along these highways years hence.

It is surely not good policy to enrich other nations at the expense of our own people, as we are now doing in sending millions of dollars annually to foreign countries in payment for such luxuries as edible nuts that could be readily and profitably produced at home. There need be no fear of an overproduction of such things, no matter how many may

engage in their cultivation, because in such industries many will resolve to do, and even make an attempt, but a comparatively small number will reach any marked degree of success.

CHAPTER II.

Table of Contents

THE ALMOND.

Table of Contents

Amygdalus, *Tournefort*. Name supposed to be derived from *amysso*, to lacerate, because of the prominent sharp, knifelike margin of one edge of the deeply pitted, wrinkled nut. Martius, an Italian botanist, suggests that the name came from the Hebrew word *shakad*, signifying vigilant, or to awake, because after the rigors of winter the almond tree is one of the earliest to hail the coming of spring, with its flowers. The common English name is from the Latin *amandola*, corrupted from *amygdala*. In French it is *amandier*; in German, *mandel*; Portuguese, *amendoa*; Spanish, *almendro*; Italian, *amandola*, *mandalo*, *mandorla*, etc.; Dutch, *amendel*; Chinese, *him-ho-gin*.

Under the natural classification of plants the almond belongs to the order *Rosaceæ*, and in the tribe *Drupaceæ*. Linnæus placed the peach and almond in the same genus, and they are now generally considered to be only varieties of one species,—the wild almond tree is probably the parent from which all the cultivated peaches and nectarines have descended. In most of our modern botanical works these fruits are classed as a sub-section of *Prunus*, the plum. They are mainly deciduous shrubs, or small trees. The flowers are variable, both in size and color; but in the almond they are usually somewhat larger than in the peach, almost sessile, and from separate scaly buds on the shoots of the

preceding season, appearing in early spring, before or with the unfolding leaves, the latter being folded lengthwise in the bud. Leaves three to four inches long, tapering, finely serrate, with few or no glands at the base of the blade, as seen in many varieties of the common peach. Fruit clothed with a fine dense pubescence in both peach and almond; but in the latter the pulpy envelope becomes dry and fibrous at maturity, cracking open irregularly, allowing the rough and deeply indented nuts to drop out; while in the peach the pulpy part becomes soft, juicy and edible, the reverse of the almond. The nectarine is only a smooth-skinned peach.

History of the Almond.—As with most of our long-cultivated fruits and nut trees, very little is now known of the early history or origin of the almond, and even its native country has not been positively determined, although it is supposed to be indigenous to parts of Northern Africa and the mountainous region of Asia. Theophrastus, who wrote a history of plants about three centuries before the Christian era, mentions the almond as the only tree in Greece that produces blossoms before the leaves. From Greece it was introduced into Italy, where the nuts were called *nuces græcæ*, or Greek nuts.

Columella, about the middle of the first century of our era, was the earliest Roman writer to mention the almond as distinct from the peach. From Italy this nut was slowly disseminated, making its way northward mainly through France, reaching Great Britain as late as 1538 (*Hortus Kewensis*). But its cultivation has never extended in Britain, beyond sheltered gardens and orchard houses, owing to the

cool and otherwise uncongenial climate, and the same is true of Northern France and other regions to the eastward in Europe. But in the south of France, also in Italy, Spain, Sicily, and throughout the Mediterranean countries, both in Europe and Africa, the almond thrives, and has long been extensively cultivated. These nuts are an important article of commerce, immense quantities being exported by Spain, mainly from Valencia, while the so-called Jordan almond comes from Malaga, as very few are raised in the valley of the Jordan. Bitter almonds come principally from Mogador in Morocco.

As for almond culture in the United States, very little is to be said further than that, while we have few experiments to refer to as having been made east of the Rocky Mountains, not one of our great pomologists, in their published works, has ever given any reason for the almost entire neglect of this nut. Mr. Wm. H. White, author of "Gardening for the South" (1868), throws no light upon the subject, merely describing a few of the well-known varieties of the almond. Downing's "Fruit and Fruit Trees of America," Thomas' "American Fruit Culturist," Barry's "Fruit Garden," and a score of other standard pomological works may be consulted, without obtaining therefrom any information in regard to the culture of this nut further than to be assured that the hard-shelled varieties are hardy in the North wherever the peach tree thrives, and the thin, or paper shelled, succeed only in warm climates. All these authors agree in saying that the propagation and cultivation of the almond is the same as practiced with the peach.

Coming down to recent years for information in regard to almond culture, we find H. E. Van Deman, pomologist to the Department of Agriculture, dismissing the subject in his report for 1892, as follows:

> "I only mention this nut to state to all experimenters that it is useless to try to grow the almond of commerce this side of the Rocky mountains, except, possibly, in New Mexico and southwestern Texas. This is thoroughly established by many reports from those who have tried it in nearly every State and for many years past. It is too tender in the North and does not bear in the South. In California it is an eminent success.
>
> "The flavor of the hard-shelled almond, so far as I have tested it, is little or no better than a peach kernel, and is therefore practically worthless. The tree of this variety is about as hardy as the peach, and bears quite freely. The attention paid to the almond in the Atlantic and Central States might well be given to other nuts."

This is certainly a very easy way of disposing of the cultivation of a nut which has so long figured among our importations from European countries; besides, no experiments are cited, experimenters named, or reasons given why almond culture is a failure in the Southern States. But fortunately there are men in the South who are able and ready to give reasons for their opinions and statements, in regard to the cultivation of crops or plants with which they have become familiar through personal experience. When I asked Mr. P. J. Berckmans, Augusta, Ga., president of the

American Pomological Society, for information on this point, he promptly replied as follows:

> "The reason that almonds are not cultivated in Georgia and other Southern States is because of their early blooming, as spring frosts usually destroy all the blossoms. We have tried many varieties of the soft-shell without success. The hard-shell will occasionally bear a crop of fruit, as it blooms later, and the blooms seem to resist cold better than the other varieties. In middle Florida soft-shell almonds are sometimes successful, but they have been tried so sparingly that I cannot obtain any satisfactory reports."

Admitting, as we do, that President Berckmans' long experience in the cultivation of nut and fruit trees in the South enables him to speak with authority on this subject, still, we have some encouragement for continuing experiments with the almond in regions known to be favorable for the cultivation of its near relative, the peach. Furthermore, experiments seem to be wanting with the almond in the more elevated regions of the northern line of Southern States, also in Maryland, Delaware and southern New Jersey, near the seacoast, or other large bodies of water, which, as is well known, have considerable influence in retarding the early blooming of fruit trees, as well as warding off late spring and early autumn frosts.

It is scarcely reasonable to suppose that a region of country as extensive as that of one-half of the Middle and all of the Southern States, with a range of climate admitting of the successful cultivation of such hardy fruits as the apple

and pear, and from these down to the pineapple and cocoa-nut, should not yield a locality or localities admirably adapted to the cultivation of the half-hardy almond tree. It is no doubt true that there are extensive regions in the South where late spring frosts are exceedingly troublesome, and sometimes disastrously so, to fruit growers; but even these have their limits, as shown in the vast quantity and variety of fruits annually produced in the Southern States. But great local variations in climate are natural to all countries in the temperate zone, and we frequently find the most favorable and the unfavorable for fruit culture within a few miles of each other.

If there are not thousands and tens of thousands of acres of land located in favorable positions between Virginia and Florida, adapted to produce the commercial almond in some of its varieties, then we must confess that the study of climatology is of little use to the pomologist. Furthermore, all the varieties of the so-called hard-shelled almonds which thrive in our northern States are not worthless, neither are the kernels of all of them "bitter," and even if they were, they would still be worth cultivating, else we would not import such vast quantities from Morocco to supply the demand.

If none of the thin-shelled varieties heretofore tried in the South are successful, it is time that either our experiment stations or individual horticulturists made some attempt to produce those that are adapted to that region of country. But until we have some more definite information than heretofore disseminated, in regard to almond culture in the South, it is safe to conclude that failures in the past have

been due mainly to want of judgment, or knowledge of varieties and of positions for the orchard, with, perhaps, some neglect in care and cultivation.

In California almond culture has been pushed with vigor for several decades, but at first with rather indifferent results, because growers depended upon noted European varieties, which, as experience proved, were not adapted to the soil and climate of the country. In a paper read before the American Pomological Society at its session held at Sacramento, Cal., Jan. 16-18, 1895, Prof. E. J. Wickson, of the University of California, alluded to this subject of almond culture in the State as follows:

> "In no branch of this effort for improved varieties has our success been more marked than in the development of seedling almonds. The achievements of A. T. Hatch in this line are too well known to require but a passing allusion. It is not too much to say that this work rescued almond culture to California. When he began, the almond, because of almost universal failure of the old varieties, was a jest and a byword in our horticulture. Nine-tenths of all the almonds planted during the preceding twenty-five years had gone for firewood or were carrying the foliage of the prune to conceal their hated stems. At the present time, through the dissemination of Mr. Hatch's varieties, the almond, in all regions decently adapted to the tree, is productive and profitable and has a future."

FIG. 1. A CALIFORNIA ALMOND ORCHARD.

That almond culture in California is rapidly becoming an important and successful industry, we have an ocular demonstration in the tons of these valuable nuts received from there in the past few years, and placed on sale in Eastern markets. If one man, by his individual efforts, can revolutionize or establish a great industry in a region as large as the State of California, it is not too much to expect that something of the kind could be done elsewhere, with the combined efforts of several men. If the varieties heretofore tried in the East are unsuited to the climate, it is certainly within the range of probabilities that others better adapted to surrounding conditions can be produced. The native grape, raspberry and strawberry have had a history similar to the almond, but now all are extensively and successfully cultivated.

Propagation of the Almond.—The propagation of the almond is identical with that of the peach: that is, from seed to procure new varieties, or by budding the more desirable ones, when obtained, upon seedling almond, peach or plum stocks. The half-wild hard-shelled almond is probably the most congenial and best stock for this purpose, but seedlings of the peach are most generally employed because the most abundant and cheapest. Under certain conditions, such as cold, heavy, moist soils, and where rather dwarfish trees are desired, the plum may be employed with advantage as a stock, but it is not to be recommended for general orchard culture. In mild climates seedlings of the best of the soft-shelled varieties may be raised and planted in orchards without budding, but the nuts from such trees are likely to be somewhat variable in size and quality, although the trees will usually prove to be as healthy and productive as those subjected to artificial modes of propagation. If, however, the grower desires a uniform product, he must resort to the usual means of obtaining it; that is, multiplying superior or distinct varieties by budding, either upon peach, almond or other stocks. It is advisable, as well as exceedingly important, for all who intend or feel inclined to cultivate almonds in regions where the adaptation of this nut has not been fully established by years of practical experience, that seedlings should be raised in large numbers, and from these a selection be made to meet the requirements of the climate and other conditions under which they are to be propagated and grown. If spring frosts have been heretofore inimical to the cultivation of the almond, then the production of late-

blooming varieties would be a remedy. There will also be variations in the season of ripening; some may come on too early, others far too late for special localities, but all these faults or variations may be readily overcome by raising seedlings, and then selecting for propagation those coming nearest fulfilling the requirements of local conditions or circumstances. It is by such experiments and means that fruit culture has reached its present position in this and all other countries, where it is practiced as an art or industrial pursuit. Varieties that have become exceedingly popular and profitable in one locality or country, may not have succeeded elsewhere, and this holds good with all cultivated plants.

In making experiments with the almond in regions where it has not been cultivated, but under conditions which appear to be favorable, I would certainly advise testing the well-known varieties first, and if these fail, then see what can be done in the way of producing new ones adapted to the locality and climate.

Raising Seedlings for Stocks.—In warm or moderately mild climates the nuts, whether peach or almond, may be planted soon after they are gathered in the fall, but should the weather continue warm and moist the nuts will sometimes sprout prematurely and the young sprouts get frosted later in the season, and for this reason it is better to store them in a cool room, packed in dry sand or soil, until the approach of steady cold weather, and then plant. Having lost choice kinds of nuts from being in too great haste in getting them into the ground in the fall, I am prompted to give this warning to those who have had no experience in

raising nut trees. If not convenient to plant in the fall, nuts of all kinds may be packed in barrels, boxes, or similar vessels, mixed with or stratified with sharp sand or light soil, then stored in a dry, cool place,—a very cool cellar will answer, but in my experience, out of doors is preferable,—and in the shade of some evergreen tree or on the north side of a building, and there banked over with earth just sufficient to keep the nuts at an equably low temperature. It is advisable to have a few small holes in the bottom of the barrels or boxes, to insure proper drainage, should any considerable amount of water get in at the top; but this will not occur if the vessels are properly covered with boards when placed in position for winter.

It must also be kept in mind that mice, squirrels and chipmunks are fond of almonds and other kinds of edible nuts, and if placed where these little rodents can find them, they are sure to take a share, or perhaps the entire store, before their visits are discovered. I have known field mice to dig down under boxes of nuts, enlarge the holes left for drainage, and spend the winter among the chestnuts which I had put away for planting in spring. The safest way is to place fine wire netting on the bottom of the box, and then cover it with the same. Owing to the abundance of mice and other little nut-eating animals, I have never dared to plant out nuts in the fall, and so have always stored them in sand, but out of doors during the winter, and well covered with earth. In other localities it may be safe to sow in autumn, and if protection from vermin is required, coat the nuts with gas tar, the same as practiced by farmers in protecting seed corn against the attacks of crows and other corn-pulling