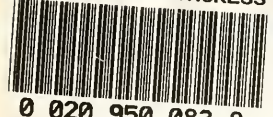


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# Luther Burbank's Spineless Cactus



Trademark

Registered

This Seal guarantees a genuine Luther Burbank Production

## The Luther Burbank Co.

Sole Distributer

Santa Rosa, California, U. S. A.

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SB317  
.C2L8

A man must confine his efforts to one occupation if he is to do it well.

To be a successful creator of new forms of plant life, and a successful merchant is beyond the limit of one man.

Such is my case.

I must either confine myself entirely to selling my new varieties of plant life and leave the development alone; or confine my efforts to new forms and improved varieties, without distributing them to the world and making them of practical usefulness.

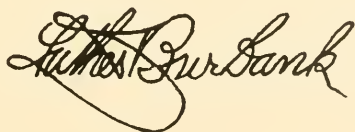
I prefer to devote my entire energies to production.

Plant life is my one absorbing thought night and day.

In view of these circumstances, a corporation has been formed which will manage, market, and carry on exclusively the business of selling the various new forms of plant life which I have evolved. This corporation is the sole distributor of the Luther Burbank horticultural productions, and from no other source can one be positively assured of obtaining genuine Luther Burbank creations.

It is called The Luther Burbank Co. To give each purchaser a guarantee of receiving original Burbank productions this corporation has originated a trade mark. The name "Burbank" has been so indiscriminately and fraudulently used that it has in a measure lost its true significance. Every package of seed and every plant sent out from this corporation will have this trade mark on it for your protection. All fraudulent uses of the same will be vigorously prosecuted and any information that will give knowledge of its misuse will be welcome.

Signed,

A handwritten signature in cursive script that reads "Luther Burbank". The signature is written in dark ink and is positioned below the typed name "Signed,".

# The Spineless Cactus

For hundreds, probably thousands of years, the great, rapid growing, desert thorny cactus (*Opuntias* and others), have furnished food for stock and fruit for man, especially in Southern Europe, Northern Africa and Mexico, where the fruit, though rather seedy and difficult or almost dangerous to handle, is very

highly prized, more so perhaps than any other fruit except the orange and banana.

The whole plant furnishes nutritious food in abundance, yet great pain and often death was the penalty for using them.

Seventeen years ago the first scientific experiments for their improvement were instituted on Luther Burbank's farms.

## How to Judge Novelties—Look to Their Source.

The greatest inconvenience and injustice is not misunderstanding, prejudice, envy, jealousy, ignorance or ingratitude, but that purchasers are so often deceived by various unscrupulous dealers who, taking advantage of the name "Burbank" hoist on the public green carnations, hardy bananas, half wild, thorny cactus for Burbank thornless ones, blue roses, seedless watermelons, cigars, soap, real estate, magazine articles, obtaining money or positions under false statements of having been in his employ, and a thousand other similar schemes; and by outrageous

misrepresentations or the change or addition of a word or two from the correct descriptions, deceiving purchasers even when a genuine product of real value may happen to be offered.

Wise planters procure their cuttings and plants from the original source. Tons of so-called "thornless" cactus cuttings have been sold to unsuspecting customers as "Burbank's" or "just as good as Burbank's" by a few dealers who well know that they are not in any respect what they claim for them.

## History of the Spineless Cactus

By Luther Burbank.

For more than fifty years I have been quite familiar with "thornless cactus" of many species and varieties. In fact, one of the first pets which I had in earliest childhood was a thornless cactus, one of the beautiful *Epiphyllums*.

The *Phyllocactus* and many of the *Cereus* family are also thornless, not a trace to be found on any part of the plants or fruit. Thus the somewhat indefinite popular name of "spineless cactus" has been used by persons unacquainted with

these facts, for be it known that "thornless cactus" is no more of a novelty than a "thornless" watermelon.

But among the *Cacti*, which grow to an immense size with great rapidity and which can be readily cultivated in garden, field or desert no perfectly thornless ones were known and very little interest taken in the *cacti* of any kind, either thorny or thornless, as to their agricultural or horticultural value until some seventeen years ago when the work of improvement

was taken up on my experiment farms, and improved perfectly smooth, rapid-growing varieties had been produced and made known.

Some of the best growers among these will produce five to ten times as much weight of food as will the wild thorny ones (which some ignorant or unprincipled dealers have recommended for cultivation), under exactly the same conditions. These wonderful results were not unexpected as the genus *Opuntia* is a surprisingly variable one even in the wild state.

The best botanists—even those who have made the *Opuntias* a special study—declare it to be one of the most difficult genera to classify, as new forms are constantly appearing and the older ones so gradually and imperceptibly merge together. The facts without doubt are that their ancestors had leaves like other vegetation and were as thornless as an apple tree, but in ages past were stranded in a region which was gradually turning to a desert, perhaps, by the slow evaporation of some great inland lake or sea.

Being thus stranded the plants which could adapt themselves to the heat and drought which as the years passed by became each season more and more severe, survived, at first by dropping the leaves, thus preventing too much evaporation, leaving the fat smooth stems only to perform the functions of leaves.

The *Opuntias* even to this day always shoot out very numerous rudimentary leaves, which persist a few days or weeks and then, having no function to perform, drop off. These rudimentary leaves which always appear for a time on the young slabs are often mistaken for big thorns by those who are not familiar with the growth and habits of the plant.

But the *Opuntias* had yet to meet another enemy; desert animals were hungry for their rich stores of nutriment and water, so the rudimentary leaves were supplemented by the awful needle-like thorns placed at exactly the right angles for the best defense.

Some seventeen years ago, while testing the availability of a great number of

proposed forage plants from the various arid regions of the world with a view to the improvement of the most promising, I was greatly impressed with the apparent possibilities in this line among the *Opuntias*, which from their well-known vigor and rapidity of growth, easy multiplication and universal adaptability to conditions of drought, flood, heat, cold, rich or arid soil, place them as a class far ahead of all other members of the great cactus family, both as forage plants and for their most attractive, wholesome and delicious fruits, which are produced abundantly and without fail each season.

These fruits which are borne on the different species and varieties, vary in size from that of a small peanut to the size of a very large banana and in colors of crimson, scarlet, orange, yellow and white, and also shaded in various colors like apples, pears, peaches and plums, and with more various attractive flavors than are found in most other fruits except perhaps the apple and the pear, the product of a single plant being often from 50 to 200 pounds per annum, some bearing one crop, others two or more each season like the figs, the first or main crop ripening as the second comes into bloom on the same plants.

The *Opuntias*, from root to tip, are practically all food and drink and are greatly relished by all herbivorous animals, and for this very reason have had to be on the defensive, and perhaps nowhere in the whole vegetable kingdom have such elaborate preparations been made; the punishment inflicted is immediate, the pain severe and lasting, often ending in death, so that all living things have learned to avoid the *Opuntias* as they do rattlesnakes, and notwithstanding their most delicious and nourishing fruit produced unfailingly in greatest abundance have never before been systematically improved by the Agriculturist and Horticulturist as their merits so well deserve.

By my collectors and others, for the earliest experiments in this work the best *Opuntias* from all sections of Mexico, from Central and South America, from North and South Africa, Australia, Japan, Hawaii and the South Sea Islands, were

secured. The United States Agricultural Department at Washington, through my friend, Mr. David G. Fairchild, also secured eight kinds of partially thornless ones for me from Sicily, Italy, France and North Africa, besides a small collection of Mexican wild thorny ones which were in the government greenhouses at the time. Besides these I had the hardy wild species from Maine, Iowa, Missouri, Colorado, California, Arizona, New Mexico, Dakota, Texas and other States.

All these were grown and their agricultural and horticultural values studied and compared with great care.

Many so-called thornless or partly thornless ones were obtained, but not one among the thousands received from all these sources was free from thorns and spicules and even worse, those which were the most promising in these respects often bore the poorest fruit, were the most unproductive of fruit or produced less



Thorny and Smooth.



fodder or were less hardy than the wild thorny species and varieties.

The first work was to select the best of these, cross them, raise numerous seedlings, select the best of these and so continue hoping for improvement.

One of the first and not unexpected facts of importance to be observed was that by crossing, the thorns were often increased rather than diminished, but not so with all. Some very few still became even more thornless than their so-called thornless parents with greatly increased size and quality of leaves (raquettes or slabs), and among them a combination of the best qualities of both parents with surprising productiveness of slabs for feeding.

The work is still in progress but on a still larger scale and now these improved Opuntias promise to be one of the most important food-producers of this age, some of these new creations grown from the same lot of seed yielding fully ten times as much feed as others under exactly the same conditions.

Old half thornless ones have been grown for ages. Among the very numerous wild seedling Opuntias, partially thornless ones have appeared from time to time and these have been growing generally unnoticed here and there in every part of the earth where the thorny ones grew, the seeds no doubt scattered by birds and other agencies. Some of these bore fairly good but seedy fruits and have been locally cultivated for ages, but have never received specific horticultural names or descriptions though the fruits of these and the thorny ones have long been used extensively as food and are the principal source of food for millions of human beings in Southern Europe, North Africa, Mexico and other lands, for about three months in each year.

Systematic work for their improvement has shown how pliable and readily moulded is this unique, hardy denizen of rocky, drought-cursed, wind-swept, sun-blistered districts and how readily it adapts itself to more fertile soils and how rapidly it improves under cultivation and improved conditions.

Some one asks: "Won't they run wild

again and produce thorns, when placed under desert conditions?"

Has the "Burbank" plum which though introduced twenty-two years ago and is now more widely grown than any other plum on this earth, shown a tendency to be different in Africa, Borneo, Japan, Egypt, Madagascar or France? No, it is the same everywhere and the residents of Chicago, Auckland, London, San Francisco, New York and Valparaiso consume them in great (and rapidly increasing) numbers of carloads each season. The same may be said of the later introduced Wickson, America and numerous other plums and of my improved fruits and flowers which are extensively grown and generally offered for sale by most responsible firms in all civilized countries and are generally slowly but very surely replacing the old and heretofore standard varieties.

It will be so with these "new creations" in Opuntia. Tens of thousands of others not now ready to be distributed are under test, this catalog partially describing only the beginnings of a great work with the Opuntias, which in importance may be classed with the discovery of a new continent.

Does this work which has been only just briefly outlined mean anything?

Intelligent people everywhere know well that it means a new agricultural era for whole continents like Australia and Africa and millions of otherwise useless acres in North and South America, Europe and Asia.

And now during the past three years the United States Department of Agriculture has despatched agents to all parts where cacti grow to look up this matter among those who had for years been feeding the wild, thorny ones to their stock with good results when properly prepared by fire, though it is acknowledged that thus prepared a portion of their nutritive value is lost and though the dangers of loss from feeding to stock are lessened, are not by any means made safe, even by singeing or any other process, while many of these new thornless ones are as safe to handle and as safe to feed as beets, potatoes, carrots or pumpkins.

But let it be understood that these thorns are not growing on the wild Opuntias for ornament any more than poison fangs, teeth, claws and stings are possessed by various animals.

They are for defense, and when deprived of these defenses they must be protected from stock like any other feed grown in farm, fields or gardens.

Still some doubter who has no knowledge of desert conditions or of these new plants will say, "Will it pay?" . Does anything pay? Some people seem to think that corn, wheat, oats, barley, cotton, rice, tobacco, melons and potatoes pay.

How many tons of hay, beets or potatoes can be raised each season on an acre of good soil? Yes, well, by actual weight



The Spineless Cactus.

in the summer of 1906 in the cool coast climate of Sonoma County, Cal., on a heavy, black "adobe" soil, generally thought wholly unsuited for cactus, my new Opuntias produced the first year, six months from single rooted leaves, planted about June 1, an average of 47 1-2 pounds per plant or one-fourth acre, yielding at the distance planted (2 1-2x5 feet), at the rate of 180,230 pounds, over ninety tons, of forage per acre.

Some of the best varieties produced very much above this average.

Though planted much too closely for permanent field culture yet these notes are of interest on a subject of which little has been known.

These Opuntias are always expected to and do produce nearly or quite double as much feed the third and succeeding years as they do the second season of planting. Yet, I would not expect one-fourth the above yield on desert soil without irrigation but would expect nearly or quite twice as much as the yield mentioned above in a very warm climate with one or two light irrigations each season.

These improved Opuntias must of course be fenced from stock when young, but after two or three years' growth stock may safely be turned loose among them as with age the main stem becomes woody and will not be injured, but on removal of stock will at once make a most rapid new growth.

The leaves are to be fed to stock at any season throughout the whole year when most needed, and in countries where great numbers of valuable stock are lost in times of unusual drought, will be of inestimable value and will also prove of enormous value in less arid countries as a common farm or orchard crop even on the best agricultural soils but more especially on barren, rocky, hill and mountain sides and gravelly river beds which are now of no use whatever.

The small, hard, wild thorny cactus has been a common everyday food for horses, camels, mules, oxen, growing and beef stock, dairy cows, pigs, and poultry for more than fifty years.

Though millions have died from the thorns\*, yet, no systematic work for their improvement had been taken up until some seventeen years ago; now agriculturists and horticulturists in every land

are deeply interested and the governments of all countries are taking measures to secure a stock of the improved Burbank Opuntias to avoid if possible the too common occurrence of famines, for the Opuntias can remain uncultivated and undisturbed year after year, constantly increasing in size and weight until needed; then each acre will preserve the lives of a hundred animals or even human beings for months until other food can be obtained.

The wild cactus is generally prepared for stock by singeing the thorns with fire, yet this never destroys all of the thorns.

Those who have fed the wild cactus extensively acknowledge that cattle are often seen with blood dripping from their mouths, and that their throats and tongues become at last inflamed, very painful and hard like a piece of sole leather.

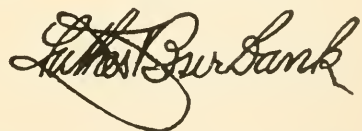
How would you enjoy being fed on needles, fish-hooks, toothpicks, barbed wire fence, nettles and chestnut burrs? The wild, thorny cactus is and always must be more or less of a pest.

Millions of cattle, sheep, goats, hogs, ostriches and other animals have been destroyed by it.

The new thornless ones will withstand flood, drought, heat, wind and poor soil better than the wild ones and will produce one hundred tons of good food where the average wild ones will produce ten tons of inferior food.

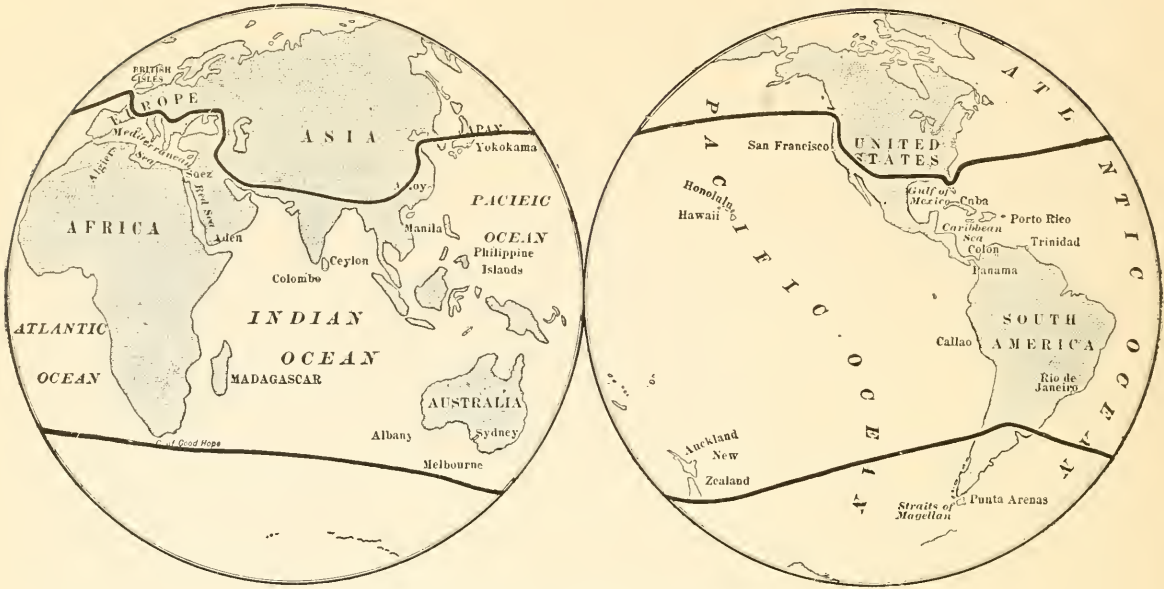
Dry seasons which are certain to come have been and will continue to be the source of irreparable loss to stock raisers. Even alfalfa, which is probably the most important forage plant in existence, can not be grown without a deep rich soil and an abundant supply of water.

Many of the owners of the great stock ranges have seen the necessity of some insurance against these fearful losses and are devoting certain tracts to these new cactus plants to avert this danger as well as for supplementing the usual feed.



\*The wild cactus is prepared by boiling or steaming in Australia in times of drought, but even though great loss of stock is sometimes reported when thus prepared, some are saved from otherwise certain starvation.

# Where Cactus Can Be Successfully Grown.



Map of Globe, Where Spineless Cactus Can Be Grown.

Cactus can be grown close in along the coast of California south to San Diego, in the great valleys of California, in a considerable part of Southern Arizona, Southern New Mexico, Southern Texas, Southern Louisiana and all along the Gulf and Atlantic Coast of the United States well up to South Carolina for about one hundred miles inland, more or less, according to elevation and other factors. In a general way, this is the part of the United States best adapted for cactus culture.

### RESTORING THE LAND

There is every prospect that before the life's work of Luther Burbank has ended he will have seen thousands of square miles of desert lands of the world trained to a profitable condition of fertility through the medium of his spineless cactus. The British government is considering the feasibility of introducing Mr. Burbank's hybrid plant in the Sahara desert, with a view of eventually forcing the most unprolific district in the world to support life.—'Register-Leader,' Des Moines, Iowa.

Maps of the Globe with cross lines indicating the northern and southern limits for the successful cultivation of the new Giant Burbank Cactus plants for fruit and forage; it will be observed that the whole continents of Africa and Australia, most of South America and the southern part of North America, Southern Europe and Asia and most of the thousands of islands of the seas are included in the territory where they can be grown; even this great territory including more than three-fourths of the inhabitable land of the earth is being somewhat extended by the production of hardier varieties. This work is progressing slowly but very surely.

"The production of these new spineless fruiting cacti is, in my opinion, as important to the world as the discovery of a new continent."—Judge S. F. L., San Jose, Cal.

# Of Easy Culture and Rapid Growth

Always Grown from Cuttings, Never By  
Seeds.

Everybody knows that Baldwin apples, Bartlett pears and our favorite peaches, plums and cherries can not be raised from seeds; just the same laws hold true with the improved Opuntias, but fortunately they can be raised from cuttings in any quantity with the utmost ease—more truly they raise themselves, for when broken from the parent plant, the cuttings attend to rooting without further attention, whether planted right end up, bottom up, sideways or not at all.

Best results are generally secured by planting the lower half of the cuttings below the surface of well prepared, dry, warm soil or sand.

The two chief classes of Opuntias from which the majority of varieties of spineless cactus originated are the Ficus Indica class and the Tapuna class, the Ficus Indica class being more thoroughly domesticated and cultivated.

The Ficusindica class may also be called the "Barbary Fig" class, most of the varieties yielding superior fruit in larger quantities than the Tapunas. They are also probably the heaviest producers of slabs, which are usually grass green in color and of a variety of shapes. The pads are produced in great masses. The Fresno and Santa Rosa are of the Fucus Indica class.

The Tapuna class of spineless cactus contains the hardiest of the Opuntias. The

Monterey and Chico are of this class and each variety possesses great resistance to extremes of temperature. The slabs are usually a pale greenish white and have a minimum of fibre. They are very juicy and succulent and are perhaps the most palatable to live stock, which eagerly devour the pads.

These varieties bear large quantities of fruit of the coarser kind which is highly desirable as hog or stock food, owing to the high percentage of sugar. This is of considerable importance and offers variety in feeding the slabs.

No form of plant life perhaps responds more readily to kindly treatment than the Opuntia. This is demonstrated in the faster, heavier and generally better growth possible through a moderate amount of cultivation, the keeping down of grass and weeds, during the earlier periods of growth. Larger yields of finer fruit and more and tenderer pads are the result of proper treatment. It is but natural that under distressing conditions due to the lack of proper care some varieties, especially fruiting varieties, may develop a few short spines on the edge of a slab or rarely one here and there, but these generally will be found, if at all, to be soft and cottony and so insignificant as to be harmless. What spines do appear as a general thing—will drop off as the plant grows older.

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Professor J. P. Leotsakos says in regard to the Cactus:

"The old, somewhat thorny fruiting cactus is in my native country one of the principal foods for both opulence and poverty during three months of the year when it is abundant. These pear fruits are delicious, exceedingly nutritious and healthful. I would rather by far have half a dozen of them for breakfast than the best beef-steak or any other food. The fruit of these perfected cacti is the best fruit food for man or beast and Mr. Burbank is a great benefactor in perfecting the cactus. If he lived in Greece a monument would be erected to him in every city. I have never seen in all the world such an astounding

crop of fruit as I saw on Burbank's new varieties of truly spineless cactus at Santa Rosa, California."

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Prof. J. P. Leotsakos is a graduate of the Royal Classical College of Athens and a teleiofoitos of the law department of the University of Athens, and belongs to one of the best known families of contemporary Greece. His father was the commander of the revolutionary army that brought about the deposition of King Otho in 1862, afterwards an aide-de-camp to the present King George, and finally Senator from Lakonia in the Greek Parliament at Athens.—D. N. Botassi, Consul General of Greece.

# The New Burbank Opuntias



The best of these improved Spineless Opuntias when grown under favorable conditions on good soil in a warm climate may confidently be expected to produce an average of nearly or quite fifty to one hundred tons of feed per acre when once established, each season.

So much has been written about the spineless cactus and so many are deceived with the old cheap, half-wild varieties which are so often offered as "Burbank's" or "just as good as Burbank's" that it seems necessary to have them distributed direct from the originator and under correct descriptions so as to avoid as much as possible any misunderstand-

ings, exaggerations or misstatements such as heretofore have been carelessly, ignorantly or willfully made. Utterly spurious "Burbank's Thornless Cactus" has been offered for sale by dishonest parties for six years or more, not only in America, but also in Europe, Africa and Australia.

In producing these new Opuntias more than seventeen years and much thought, labor and capital have been expended, thousands of crosses have been made and many hundred thousand seedlings and crossbred seedlings raised. The finished product is receiving a royal welcome everywhere by those who know.

Few of the cacti are of any economic value except the Opuntias; of these there are more than one hundred and fifty species and innumerable varieties; all probably originally natives of the Western Hemisphere and were cultivated by the Indians long before Columbus discovered America. No class of plants are more easily grown, soil is not of much importance and cultivation almost unnecessary.

The leaves of these new Giant cactus varieties should be shrunken slightly or wilted at least (except in absolutely dry deserts or in very warm summer weather). Meantime an earlier and more rapid growth will be secured by plowing and harrowing the land as for any other crop.

The cuttings may then be easily and rapidly planted one-third to two-thirds

their length under ground, either with spade or plow, in deserts slanting towards the position of the two o'clock p. m. sun; or they may simply be thrown on the ground and left to themselves; in either case they will grow, but in the end it is probably better to plant as above.

Three by ten feet apart is the best distance for permanent plantations, either for fruit or forage, but they may be planted at half these distances and later, three-fourths of the plants removed.

People who are not acquainted with the cactus often mistake the numerous pointed leaflets on the undeveloped slabs for spines. These, having no function to perform, soon drop off. They are as different from spines as blossoms are from leaves.



View of Spineless Cactus Field in Fruit.

# The Spineless Cactus for Forage

The leaves or slabs of the spineless cactus are used for food for all kinds of stock including poultry. The whole plant, both the leaves and the fruit, almost without exception, finds immediate favor with all herbivorous animals.

They actually prefer it to almost any other food. More than that, it makes a superior quality of beef and exceedingly rich milk. This is not surprising as the cactus is one of the richest foods known in sodium, potash and magnesium, which are the principal salts found in milk.

These valuable organic salts are found in the cactus more abundantly than in any other food.

The fact is often observed that animals, when fed on cactus, improve in condition more than can be accounted for by the usual chemical analysis for food values. It has been a matter of much study by chemists until it was discovered by actual experiment that the organic mineral salts, known as sodium, potash and magnesia aided in the digestion of food, which was not otherwise assimilated and utilized by the animal.

"The Burbank Spineless Cactus will prove especially valuable in feeding dairy cattle as it will furnish a succulent feed throughout the entire year, so that an even flow of milk can be obtained.

When fed with a little cotton-seed meal or other concentrated food or used with about fifteen pounds of good alfalfa hay, it will prove the ideal feed by which dairymen may obtain the same quantity and quality of milk in January as in June.

Even now, the best butter is being made from dairy herds fed on singed wild cactus with only three or four pounds of cottonseed meal per day or its equivalent; while some of the best beef cattle have been fattened on the same rations and sheep, hogs and calves are being prepared for the market on an exclusive cactus diet."

As cattle always follow feed there should be an ever present market for cactus forage wherever it is grown. Besides, as the different varieties of cactus mature fruit from September to March, they enjoy a season of exceptional shipping advantages.

## Cactus Era Inevitable.

"The cactus area is just opening. Ten or twenty years hence many well informed men believe, the cactus will have supplanted and displaced alfalfa throughout a great area of the civilized world. Why? Because the cactus will grow with little or no irrigation, upon any kind of soil, with infinitely less attention than alfalfa must have and will produce far greater results in yield of fodder.

"The romance and marvel of the Burbank Cactus would fill a large book. The story of the sixteen years of patient effort employed by that wonder worker, Luther Burbank, justly calls for a place in literature.

"Imagine, if you please, a man collecting the cacti of the world, selecting from all of these varieties the best, then growing millions of seedlings, crossing and re-crossing them, selecting and re-selecting, and, finally, after sixteen years tri-

umphantly evolving from this patient, laborious process and from millions of discarded cacti, seven plants which were not only free from spines but which possessed the growing and feeding values for which he had so long striven. This, in a nutshell, is what Luther Burbank did with the cactus. Sometimes out of 100,000 seedlings, he destroyed 99,999. The remaining individual he watched and tended as carefully as a mother her nursing babe. Patience, infinite patience, had to be added to the Burbank genius, the truly Spineless Cactus.

"Of those anxious ones who have endeavored to detract from the merit of this, the greatest of the Burbank triumphs, we will say nothing. The Burbank Thornless Cactus speaks for itself. It will, by its wonder-working accomplishments, best answer all critics, whether malicious or ignorant."—Ex.



## Varieties for Sale.



Chico in Hand. Monterey Round Slab on Plant.

Chico (Forage).

(Tapuna Class.)

"Chico" is one of the two best of the new *Opuntias* of this class. The plant is an upright, compact grower with large, smooth, greenish-white pads. It is a very rapid grower. Like the Monterey this variety is very hardy and will stand great extremes of temperature. The fruit grows in profusion and is somewhat smaller than the fruit of the Monterey. Analysis by Professor M. E. Jaffa, of the State University, shows the great value of the pads for food, the amount of fat and starch especially being a surprise.

Monterey (Forage).

(Tapuna Class).

The Monterey is one of the most rapid growing *Opuntia*, and has the largest and heaviest pads, slabs or leaves of any of this class. They are nearly circular in outline, pale greenish-white, ten to twelve inches across even on one-year-old plants, and are extremely thick. The slabs have attained a weight of seven and one-half pounds. This variety is very hardy and possesses great resistance to extremes of temperature. The fruit is egg-shaped, sometimes almost globular, and grows four to ten to each slab; some of the larger weighing as much as a half pound each.

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### "BETTER THAN THE GOVERNMENT FIFTEEN TO ONE."

"On one of our experimental farms, in this state, we have some of Mr. Burbank's thornless cactus growing side by side with the best varieties of the government's thornless cactus, distributed last spring.

"The rate of increase on the part of the poorest of the Burbank cactus as compared to the best of the government cactus, is about fifteen to one."—"Enterprise," Silver City, N. M.



Fresno—Two Seasons Growth.

Fresno (Forage).

(Ficus Indica Class).

This valuable new creation is a cross-bred seedling and is a very heavy producer: makes a beautiful compact plant, fruits abundantly. The fruit is medium in size, light yellow and of fine quality. A most valuable sort for all livestock and especially hogs, which are very fond of the fruit.

Santa Rosa (Forage).

(Ficus Indica Class).

This new creation in Opuntias is a very strong, rapid grower, yielding enormously. The slabs are fat, dark green, often two feet long by ten inches wide. The original plant of this variety produced 500 pounds of slabs in three years. Fruits in fairly large quantity and of good quality. This variety is one of the best for forage.

Haleakala Ranch,  
Makawao, Maui, T. H.,  
April 17, 1905.

Editor Butchers' and Stock Growers'  
Journal:

I read with much interest in your issue of the 30th ultimo the article on "Cactus Fed Beef."

On this ranch we have one paddock of twelve hundred acres covered very thickly with cactus or prickly pear; there is also a slight growth of Bermuda grass growing. In this paddock are pastured all the year round, four hundred head of cattle and

about seven hundred hogs. The cattle only get water when it rains, that is, during the months of December and January; the other ten months they subsist entirely and solely on the fruit and young leaves of the cactus which they help themselves to. It is a remarkable fact that during the dry months of the year we get more fat cattle per cent from that paddock than from any of the others.

I consider cattle fed on cactus like these are, to have as fine flavored beef as any I have tasted in San Francisco or New Zealand.

L. VON TEMPSKY,  
Manager Haleakala Ranch Co.

## Edison on Burbank.

"Luther Burbank, the greatest originator of new and valuable forms of plant life of this or any other age."—Dr. David Starr-Jordan, President Leland Stanford Jr. University.

"It is an honor to California that Luther Burbank is its citizen. He is all that he has ever been said to be and more."—Dr. L. H. Bailey, Cornell University, N. Y.

"He stands easily at the head of the world's greatest experimentalists in plant life."—W. Atlee Burpee, Philadelphia, Pa.

"Mr. Burbank is a man who does things that are of much benefit to mankind and we should do all in our power to help him."—Theodore Roosevelt.

"I look to great practical results from Burbank's work among plants."—Thomas A. Edison.

"No other man has given to horticulture so many valuable things as has Luther Burbank."—Prof. E. J. Wickson, Dean of Agriculture, University of California.

## "Supreme Beyond Other Men."

"To Luther Burbank has been granted the knowledge, supreme beyond other men, of the susceptibility of plants to vary under the influence of new environments, delicate manipulation, and intelligent direction."—"Scientific American."

"The man who always does most says the least. Your good works will bless humanity long after you have said 'Good Night.' Your work is always a source of inspiration to me, and I am continuously wondering 'What will he accomplish next?'"—Col. G. B. Brackett, Pomological Chief U. S. Dept. of Agriculture, Washington, D. C.

"While I have long been impressed with your work, I am now overwhelmed with the vast amount of good which you have been able to accomplish. I respect your work above all that has ever been done for horticulture."—Prof. Wm. B. Alwood, Virginia College and Experiment Station.



This Illustration Shows the Monterey (Forage) Variety at a Growth of Three Seasons. Grass Evidences Lack of Cultivation.



Santa Rosa (Forage). Three Seasons Growth.

“Burbank’s thornless cactus is certainly proving itself to be the modern vegetable marvel. Nothing like it has ever been produced before. Its vitality surpasses the limit of belief, for nothing in the vegetable world has ever shown such wonderful resistant capacity, such reproductive powers, such exuberance of growth.” — “Standard,” Eureka, Cal.

**Burbank’s Thornless Cactus at Kiamuki**

“Burbank’s thornless cactus is now being cultivated at Kiamuki, and plants are being taken from there and sent to the other islands. This new form of cactus is growing well and there are hopes that it will grow rapidly on the other islands, especially in the cattle districts.

“As a food product the cactus appeals to cattle as one of the most attractive foods found in the pasture lands. Even the thorny cactus is eaten by them.”

—“Commercial Advertiser,” Honolulu, T. H.

**International Headquarters Salvation Army Service, London, E. C.**

“I am so glad to know that you will so kindly supply us with your latest varieties of absolutely spineless cactus, as I am

sure this will be most valuable to India. Next to human beings the cattle in India suffer terribly at the time of famine and scarcity; in fact, during two or three months every year they are reduced to the point of starvation during the extremely hot weather, wandering about in search of food. Hence I feel sure your cactus will be a great boon to them, for cactus, as you know, grows freely in all parts of India, only it is of the thorny kind.

“Wishing you every success in your work believe me,

“Yours very sincerely,

“F. BOOTH TUCKER.”

Imperial Russian Consulate,  
San Francisco, Cal.

Luther Burbank Esq., Santa Rosa, Cal.

Dear Sir: It is generally known that scientific societies, both public and private, as well as the world at large, are greatly interested in your work of research. Lately the Imperial Russian Department of Agriculture has turned its attention to your cultivation of the thornless cactus.

I have the honor to be

Yours truly,

K.

# From Twentieth Century Farming.

## Better Forage, Better Fruit

For hundreds, probably thousands of years, the great, rapid growing, desert thorny cactus (*Opuntias* and others) have furnished food for stock and fruit for man, especially in Southern Europe, Northern Africa and Mexico, where the fruit, though rather seedy and difficult or almost dangerous to handle, is very highly prized, more so perhaps than any other fruit except the orange and banana.

The whole plant furnishes nutritious food in abundance, yet great pain and often death was the penalty for using them.

Seventeen years ago the first scientific experiments for their improvement were instituted on my farms and the interest in these new products has been so far reaching that the official representatives of almost every government on earth have shown their profound appreciation for the work, either by correspondence, personal investigation or purchase of some of the new varieties.

It has now been fully demonstrated that these new Burbank *Opuntias* (cactus) thrive even better in the fertile valleys than on the desert wastes, producing most astounding crops not only of forage for stock and poultry but most nourishing and most delicious, large and strikingly beau-

tiful fruits of many forms, colors and qualities.

Some of the new Burbank fruiting varieties have yielded and will yield more fruit per acre even the third and fourth year from rooted cuttings than the best apple orchards will in ten years, and at one-tenth the expense; and better yet, the crop of fruit is as certain as the return of the seasons, increasing in quantity each season with no cultivation and no care whatever except to pick and market when ripe or nearly ripe like other fruits.

### Climatic Conditions and Geographical Distribution

These *Opuntias* differ astonishingly in hardiness. Some strains of the common prickly pear (*Opuntias vulgaris*) will grow readily in Alaska and several of the thorny species will endure forty degrees below zero without injury. The best agricultural and horticultural species and varieties are not quite as hardy as the fig, yet are more so than the orange, lemon or lime. Old plants are very much hardier than the young, soft ones. The Tapuna strain seem to be almost as hardy as the fig and will withstand moisture better than most of the others.



“Chico”—Three Seasons Growth.

# A Demonstration of the Superiority of Cactus as a Feed for Cows.

Mr. Charles J. Welch, who is the owner of one of the finest, blue-blood, registered Holstein herds in the West, and who is the president of the California Holstein Breeders' Association, made a test of the feeding values of cactus on a Holstein-Friesian cow, "Carren wase de kol," number 49,450. This cow was twelve years old.

The following is the report of feeding her on ordinary feed, and the results when she was fed on spineless cactus:

For six milkings for January 29, 30 and 31 previous to beginning the feeding, the cow's milk was weighed and the average per day was found to be 38 pounds. She was being fed on alfalfa hay with the herd. Alfalfa hay was the sole feed of the herd as that is all that we had at the time. It is the general winter practice here to rely on alfalfa hay. No succulent is available at this season of the year and no pasture of any kind. Consequently, any ratio of increase in her milk flow when fed cactus would be a reliable ratio of increase in the yield of milk for the whole herd if fed in a like manner.

On the start it was thought advisable to feed some bran with the cactus.

Accordingly on February 1, 1910, "Carren" was given, in addition to all the alfalfa hay that she would eat a mess composed of bran, a little corn meal and a small amount of cactus. This mess was given twice daily.

The cactus was increased a little each feed and the amount of bran and meal decreased. With this feeding she increased to 55-56 pounds of milk per day.

This method of feeding was continued to February 20, when she was getting 70 to 85 pounds cactus per day with but two pounds of bran.

On February 21, 90 to 100 pounds cactus was fed and no bran or meal and the cactus fed in three feeds, morning, noon and night, with what alfalfa hay she would eat. With the cactus alone and alfalfa hay she maintained her flow of milk with remarkable regularity.

The feeding was continued and on March 1, it was resolved to increase the amount of cactus to note the effect.

The following is the record:

	MILK PRODUCED			CACTUS FEED			
	a.m.	p.m.	Tot.	a.m.	m. p.m.	Tot.	
March 1	33	25	58	30	35	42	106
2	32	26	58	38	45	58	141
3	33	26	59	51	54	53	158
4	33	25	58	50	43	68	161
5	31	25	56	58	54	53	165
6	32	25	57	65	56	62	177
7	32	25	57	68	58	63	189
8	32	26	58	67	56	62	184
9	32	26	58	68	65	50	183
10	33	26	59	55	50	55	160
11	32 <sup>1/2</sup>	26	59 <sup>1/2</sup>	54	52	53	159
12	32	25 <sup>1/2</sup>	57 <sup>1/2</sup>	52	50	53	155
13	32	25	57	50	53	50	153
14	30	24	54	50	52	50	152
15	30	24	54	50	50	50	150
16	29	23	52	50	50	50	150
17	29	24	53	50	54	50	154
18	29	25	54	50	52	50	152
19	29	21	50	54	50	50	154
20	30	21	51	50	52	50	152
21	28	20	48				
22	21	19	40				
23	26	18	44				
24	23	17	40				
25	22	16	38				
26	22	17	39				
27	22	16	38				

## NOTES

1. From the first we noticed that with an increase in the cactus fed she ate less hay, and on the days of March 6, 7, 8 and 9 she ate but very little hay.

2. She always ate up clean all the cactus we gave her with great relish and would leave the alfalfa hay immediately when the box of cactus was placed before her. How much more than 68 pounds of cactus at one feed she would eat we do not know.

3. A slight increase in the flow of milk was noted when the larger amounts of cactus were fed. With the larger amounts her limit was evidently reached. Therefore the amount of cactus was decreased and on March 20 was stopped altogether to note the loss on the withdrawal of the cactus. She was now fed on alfalfa hay only as at the beginning of the trial. It will be noted that she dropped back to about the amount she was giving at the beginning, February 1.

4. The total amount of gain for the largest milking was 27 pounds milk per day. The average gain for the first 12 days of

March was 25 2-3 pounds per day. The average amount of cactus fed per day for the 12 days was 161½ pounds. Total amount of cactus fed for the entire time was about 4,700 pounds.

5. The condition of the cow was notably improved. Bowels about the same as when fed on green alfalfa. The larger part of the cactus fed was trimmings and scraps of last season's growth. The larger part of the cactus had been cut from the plants from six to eight weeks before it was fed. Had fresh cut, well matured slabs been fed better results would have been attained.

6. It was demonstrated that from 160 to 170 pounds per head per day with what alfalfa hay they would eat up clean, would give about the same results as a full feed on green alfalfa in the field.

**RESULT OF FEEDING BURBANK SPINELESS CACTUS AT THE CERTIFIED DAIRY OWNED BY H. R. TIMM AT DIXON, CALIFORNIA.**

	MILK. LBS.	CACTUS. LBS.
September 2, 1912	37	10
September 3, 1912	36	22
September 4, 1912	34½	38
September 5, 1912	37½	67
September 6, 1912	42	75
September 7, 1912	41	75
September 8, 1912	45	72
September 9, 1912	47	76
September 10, 1912	46	74
September 11, 1912	45½	76
September 12, 1912	43½	80

The above is the result of a test in the feeding of Burbank Spineless Cactus to a dairy cow, made at the H. R. Timm Dairy, Dixon, Cal. The test was made during a period of ten days to find out the real value of cactus as a milk producing food.

As the dairy herd was being fed on the best kind of green alfalfa and alfalfa hay it would hardly be expected that a cow would increase in milk when cactus was substituted for the green feed. On September 2, the cow was taken from the herd and placed on a ration of cactus and barley, and a light feed of alfalfa hay. With

7. The cactus that was fed was cut into pieces about the size of the hand; but a better way would be to run it through a root slicer.

8. A small amount of cactus was also tried on two young cows and they ate it greedily on sight and begged for more.

9. A wheelbarrow load of cacti was fed daily for five or six days to the hogs and they ate it greedily and with relish.

10. All the varieties were fed and relished equally well.

The above statements and facts are true to the best of my knowledge and belief.

(Signed)

CHAS. J. WELCH.

Subscribed and sworn to before me this 28th day of March, A. D., 1910.

C. O. FREEMAN,

in four or five days she ate it without any grain and soon reached a gain of ten pounds of milk daily.

I consider it a splendid substitute for green alfalfa when fed with a small amount of alfalfa hay. And I consider it doubly valuable as a cow food on account of the fact that it can be harvested and fed during the winter months when there is no other green feed.

H. R. TIMM.

NOTE: Mr. Timm is the president of the First National Bank of Dixon and the owner of one of the largest and best certified dairies in the West.

State of California,  
County of Solano—ss.

H. R. Timm being first duly sworn deposes and says: I have read the attached statement of facts and know the contents thereof and desire to state that the same are true to my own knowledge, information and belief.

Subscribed to and sworn to before me this 3rd day of December, 1912.

H. R. TIMM.

WINFILED R. MADDEN, Notary Public  
in and for Solano County, California.

**NEW PLANT FOR FORAGE.**

That Spineless Cactus Is a Success Has  
Been Proven at Yuma

The growing of spineless cactus is no longer a desert dream, or the figment of the imagination. This desert wonder is being grown in the desert lands adjacent to Yuma and some surprisingly good results are being obtained. — "Times," Boise, Ariz.

Is man also to redeem the desert for civilization? The French will test Burbank's spineless cactus on Sahara and the

desert islands of Mayotte, off Madagascar, and the English and Germans will try its virtues in their South African possessions. Burbank's creation is declared to be palatable not only to cattle, but to man, and it thrives on areas that are hopelessly arid, provided there be plenty of heat and light. It would be an almost crowning achievement if, by his genius, man, after these thousands of years were able to announce the doom of the desert.—"Journal," Portland, Ore.

# Cactus Supplies All the Water the Animals Need

There is the further consideration that the cactus supplies the animal with almost all the water it needs.

In Hawaii and Mexico cattle have been known to subsist for six months on a cactus diet without a drop of water.

Mr. Robert Hind, millionaire sugar planter and ranchman of Honolulu, writes:

## THRIVE ON DRINKLESS RANCH

Animals on Millionaire's Place in Hawaii  
Don't Know Taste of Water

KANSAS CITY, Jan. 20.—“I have horses on my ranch that do not know what water is, and will not drink it if it is brought before them. They have never tasted water. I have good fat cattle that have never seen water and would not know how to act if water touched them. I have other cattle that I have imported from the United States which have not tasted a drop of water since being turned out on my cactus and blue

grass pastures. They have lived for years without water and are as fat as any grass-fed cattle in the United States. They make just as good beef as you can get in any restaurant.”

These statements were made in sober earnest by Robert Hind, millionaire sugar planter and ranch man of Honolulu.

When water holes go dry on our own Western ranges cattle men hurry their stock out of the country. The price of beef on the hoof goes down and the price of meat goes up. Dry years mean panic among the owners of cattle, and the owner of pure-breds in the United States would not think of buying a \$1000 bull and putting him on a ranch that had neither stream, spring nor well on it. He would die of thirst in less than a week.

Mr. Hind has bought six valuable bulls. He will buy several more before he returns to his island ranch. And when he does take the animals back he will turn them loose in a pasture of cactus and blue grass growing upon volcanic soil in which there is absolutely no water for drinking purposes. And the animals will thrive as others of their kind have thrived which Mr. Hind brought here a year ago.



Result of One Slab Planted December, 1911. Photo Taken November 15, 1912, 38 Slabs Increase.





Showing a Four Seasons Growth of Spineless.

“America is letting a lot of unsalable land lie idle in what are now barren wastes,” said Mr. Hind. \* \* \* Just think of the possibilities in the millions of acres of unused and supposedly unsalable land in your country.

“We have imported blue grass from Kentucky and orchard grass from other parts of the United States, and our cattle live for a good part of the year on these grasses without water, so luxuriantly do they grow and so much moisture do they contain. When it becomes exceedingly dry and the grasses are not doing well, we turn the cattle and horses into cactus pastures. I have kept one lot of seventy-five cattle in a twenty-acre pasture of cactus for three months, and they are doing well. They put on flesh just as cattle do in your luxuriant Missouri pastures, but my cattle are without water.

“The fruit of the spineless cactus is much like that of the prickly pear in America, but is larger. We fatten our pigs, chickens and turkeys on it. Any domestic animal in Hawaii will eat it and it is a great flesh producer.”

Mr. Hind started as a sugar planter and made a fortune. Then he bought a few thousand acres next to his plantation and

imported Herefords, shorthorns and Polled Angus cattle from New Zealand. That was ten years ago. He now has sold all his cattle, except Hereford and Polled Angus. He has 2,500 cattle, 2,000 sheep and a large number of horses on his ranch now. He handles nothing but pure-bred stock.—Kansas City Times.

Alexandria, Egypt, April 23, 1908.

“The Opuntias growing in this country bear very few large thorns but the small ones, embedded bundlewise in the flesh of the leaves are very numerous and cattle as well as camels are not allowed to feed on these plants. We want to have quite thornless plants as a food for cattle and bearing fruits with a large percentage of sugar.

“Please be kind enough to send us offer for one or more varieties of plants and the amount of money we will have to send to you for posting a lot of leaves to Egypt.

“His highness the Khedive is keenly interested in the question of your Opuntias and will be glad to see a success of our future experiments.” — Charles Chevalier de Blumencron.



“Robusta.”

## Comparative Value of Cactus Forage.

There is not any particular price for cactus forage, simply because there is not any for sale. And yet the question is often asked, what is it worth? The best answer that we can give is that where one acre of land will produce enough feed for one cow, the cactus plant will grow enough feed for four. In other words it is four times the feeding value in quantity and quality of alfalfa.

In the summer of 1906 in the coast climate of Sonoma County, California, on the black heavy adobe, a soil thought wholly unsuitable for cactus, there was produced an average of forty-seven and one-half pounds per plant in six months'

growth, from single rooted leaves. These yielded 180,230 pounds or over ninety tons of forage per acre.

One may reasonably expect under favorable conditions to obtain a yield of 100 tons of good forage per acre per year.

The Spineless Opuntias will produce nearly double as much feed the third and succeeding years as they do the second season of planting.

Of course, it would not be expected that there would be more than one-fourth of the above yield on desert soil without irrigation. Still there could be expected almost twice as much as mentioned above where the climate is warm and where

there are one or two light irrigations each season.

Stock can be turned loose among the cactus, after the plants have reached an age of three years, as the main stem be-

comes woody and can not be injured. On the removal of the stock from the cactus plant pasture, new leaves or slabs rapidly appear, and in a short time has as much feed as it had originally.

## Over 200 Tons Yield to the Acre Per Year.

Oakland, Cal., Nov. 18, 1912.

On November 18, 1912, I selected what I considered to be an average plant, a fair representative of a considerable quantity of Spineless Cactus growing at the Copa de Oro Stock Farm near Los Banos, California.

The variety chosen is an average producer and its growth is equalled by other varieties.

This particular plant was six feet two inches in height and eight feet in width, and is the growth obtained from one original slab or cutting planted in January, 1910. I cut all of the new growth from the original stock and obtained 266 slabs which weighed 586 pounds. The original slab or stock had also increased in size and weighed 25 pounds. This season's crop of fruit weighed 105 pounds. No estimate is given of last season's crop which probably nearly equalled the crop obtained this year. The total weight of the slabs and

fruit obtained this season aggregates 716 pounds, all of which is good stock food. The original slab will continue to produce indefinitely.

If planted 7 by 3 feet or 2000 plants to the acre, and a like growth were obtained, the yield would approximate 716 tons of stock food per acre for three season's growth, or a yearly average of 238 2-3 tons.

The above statements and facts are true to the best of my knowledge and belief.

CHAS. JAY WELCH.

State of California, County of Alameda,  
ss.

Subscribed and sworn to before me this  
25th day of November, A. D., 1912.

MAX W. KOENIG,

Notary Public in and for Alameda Co., Cal.  
(Seal.)



Two Seasons Growth.

## Where to Plant.

Plant wherever you wish to have them grow, on rich level land or the steepest, poorest rocky hillsides, old river beds or rock piles, but their growth and succulence are greatly increased by good soil, some culture and in very dry soils by one or two light irrigations each sum-

mer. By such treatment the fruit is greatly increased in size and quality, and the slabs for feeding are doubled in weight and succulence. Nothing responds more promptly to fairly good treatment. They will flourish almost anywhere in mild climates, except where it is too wet for anything else to grow.

## When to Plant.

Cactus may be planted any month in the year, but never when the ground is wet.

No one who is familiar with them would undertake to root or transplant them during cold, damp weather, such as would be best for other trees and plants.

During April, May, June, July, August, September and October they will thrive under almost any treatment; the leaves, blossoms, buds, half-grown fruits or any part of the plant will make roots and grow, even under the most trying circumstances.

## How to Plant.

The Opuntias differ from nearly all other plants as the cuttings should be dried or slightly wilted before they will root and grow rapidly after which nothing grows so readily. When received place them in some warm shady place and allow them to remain a few days or a week, after which they will readily form roots and start to grow anywhere, even

on a board, a pile of rocks or the roof of a house if you choose. When wilted, the usual way is to plant so that about one-third to two-thirds of the cutting is below the soil. They may be planted in an upright position or at any angle from the perpendicular, or even thrown flat on the ground, it makes no difference to the Opuntias.

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“The plants will nearly meet (when planted eight feet apart) in two season’s growth, when it will be impossible to get animals and machinery through them in cultivating. The forage, however, need not be gathered unless needed for several years

“It has been called a ‘vegetable that grows fruit.’ ”

“As a poultry food it is unsurpassed. Poultry will leave alfalfa, lettuce and other green food for cactus leaves.” longer, but simply allowed to grow until the time when it is wanted. It will be fully as good feed, and, according to some, better five years later.”

“The response of this plant to cultivation is phenomenal. We know of no parallel in the history of cultivated crops. The cacti in general are considered plants of slow growth and the pear of Southern Texas is no exception to the general rule. While it might take it five or six years to grow large enough to pay to harvest in the native pastures, it makes a big crop in two years when cultivated. By actual test it grows eight times as fast with good

cultivation as it does without cultivation in grassy pastures.”

“It produces tremendous tonnage; it requires no irrigation; it is an excellent dairy roughage, good roughage for any cattle, and can be used for hogs, chickens, sheep and goats. It can be fed in a green succulent condition all the year. It has no serious insect or fungous enemies. One planting is good for repeated cuttings. It does not deteriorate with age but can be fed when five or six years old to even better advantage than when young. It is a certain crop under conditions which cause other crops to be a failure.

“That the Chamber of Commerce of the City of San Diego does most heartily endorse the efforts to spread the new Burbank fodder, thornless cactus, throughout the southwest, thereby rendering highly productive vast areas of arid and semi-arid lands, and thus still further demonstrating the agricultural importance of this section of the country.”—Resolution adopted by San Diego Chamber of Commerce.



Showing Cactus Planted in Rows.

### DISTANCES FOR PLANTING.

On fairly good soil in general field culture for stock feed, these new giant-growing kinds should be planted about three feet apart in the rows and the rows should be eight or ten feet apart. They may be planted in double rows in squares of 3x3, the double rows being fourteen feet apart. In orchard planting for the large growing, fruiting varieties four by twelve feet would be more convenient.

The selection of ordinary *Opuntia* cuttings is of some importance. Those who have grown them on the shores of the Mediterranean for hundreds of years always select "bearing wood" if fruit is the object, and the least thorny and bristly leaves if a plantation is to be produced for forage; even some of the partially spiny ones may be made less so by careful selection of cuttings but this labor is wholly useless since the new Burbank varieties are offered.

When alfalfa was generally introduced about twenty years ago, many wiseacres

declared it was "no feed for milch cows." Who says it is not good for them now?

It has been proved that the poorest of the Burbank spineless cactus varieties are so far superior to any of the old half thorny ones that no comparison with them can fairly be made. Is it then surprising that practically all the nations of the earth are anxious to obtain the new Burbank Cactus as soon as possible? Be very careful, however, that you get the Burbank cactus, not the half spineless ones so very often sold as the "Burbank" or "just as good as the Burbank," such as the builders of the pyramids of Egypt may have cultivated.

### Cultivation.

Cultivation is not so needful in cool, moist climates, but under hot, semi-arid conditions cultivation is necessary to obtain the maximum results, as no plant responds to good treatment more readily.

### Planting.

Therefore it is advisable, if maximum results are desired, to prepare the ground with a good plowing and harrowing. When the ground is in good condition it is easier to plant.

### Cost of Setting Out Spineless Cactus by Hand Labor.

In Europe cactus has been set out by hand labor, and the cost is estimated to be about \$5.00 per acre.

One man can set out 1,000 slabs a day in ground previously well prepared. In a country where traction engines can be used and large tracts set out, the cost would not exceed \$5.00 per acre.

### Climate.

Cactus will not thrive where the ground freezes over an inch in depth or where the temperature stands as low as fifteen degrees above zero for any great period. Extreme heat is not of serious consequence.

### The Kind of Land.

About six to eight inches of rainfall are required for the best cactus culture, although cactus will do well on three to five inches per season.

It is not necessary that the rainfall should be regular. The precipitation of rain can be once in four years or even as infrequent as once in ten years.

Cactus plants do not necessarily require rich land. The climate conditions are more important than the soil.

The land need not be what is generally denominated fruit or agricultural land.

Land which can be commonly purchased in the valleys of California for \$5.00 per acre up is feasible. Cactus will stand as much white alkali as any plant which grows.

The cactus yields big luscious slabs, weighing from one to seven pounds each, which can be cut at any time, summer or winter. There is no particular harvest season, therefore no necessity to harvest and store.



Showing Method of Planting.



Opuntia Leaf and Fruit.

## The New Burbank Opuntias for Fruit.

The old thorny varieties of the fruiting cactus are too well known to need description. The fruits are the principal food for millions of people during three or four months each year. The new ones now for the first time grown and here described were not in existence ten years ago. All originated on the Burbank Experiment Farms and are not obtainable at any other source. The fruits of these are greatly superior to the old kinds, and can be raised for one-tenth the cost of producing other fruits. Even the old wild kinds sell at about the same price as oranges.

No cactus bearing good, large fruit abundantly is yet wholly spineless, some are nearly so. The fine bristles on the fruits are readily removed with a small whisk broom before picking.

For the old fruiting Opuntias or Prickly Pears, eighteen thousand pounds of fruit per acre is found to be a common crop on the poorest soils, while on good soils the best Burbank fruiting varieties will and have produced at the rate of more than one hundred thousand pounds of delicious

fruit per acre. The fruits differ in various ways like apples, plums or peaches. By analysis they are found to contain from six to fourteen per cent sugar besides a small amount of protein and fat, also aromas and flavors. Some contain more of these, some less; all desirable qualities are greatly increased by scientific breeding and selection for this purpose, as with the apple, peach, sugar beet and other fruits, grains and vegetables.

Some of the earlier varieties ripen in June and July, the later ones in August, September, October and November and through the winter. Most of them commence bearing about the third year from cuttings.

The general practice to prepare the fruit for use is by brushing with a whisk broom or rubbing with a coarse cloth, then cutting a thin slice from each end through the skin, then slitting from end to end when the skin may be readily removed, leaving the solid, sweet flesh ready for use; another way is to slice through the center of the fruit from end to end and remove the flesh with a spoon.

## Fruiting Varieties.



“Quillota.”

“Quillota.”

Cross of Anacantha and White Fruit. Large plants with thick oval, light green leaves. Fruit large, handsome, yellow with crimson blush; thin skin which is readily removed; firm, pale greenish, almost white flesh; seeds medium to small; flesh sweet, rich, most excellent. Unlike other *Opuntias* it drops at once like apples when just ripe, thus saving the trouble of picking. Fruit ripens from September to April.

“Gravity.”

A strong grower with unusually large slabs. The fruit is very large (often weighing one-half pound each), yellow shaded orange, flesh yellow, sweet and delicious, with few seeds which are almost as small as tomato seeds. Plant nearly spineless. Ripe from October to March.



“Gravity.”





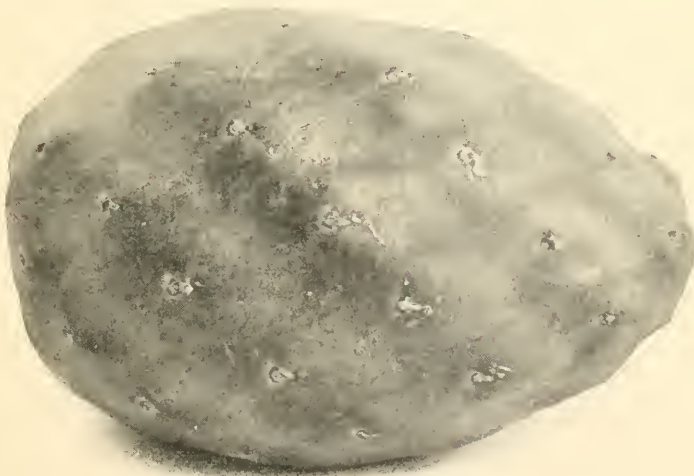
“Market.”

“Market.”

For fruit alone, if one is not disturbed with spines, “Market,” a seedling of the well known Smith will greatly please growers. Like the Smith, the plants are unusually robust growers with large, pale green slabs which are annually loaded down with brilliant, crimson six to seven ounce fruits of a pleasing compact form and very thin easily removed skin; flesh violet crimson, sweet and in every way far in advance of any of this fine class except for the few short spines. The fruit has rather large seeds but is produced so freely that it can be recommended as one of the very best of all the half spiny class.

“Niagara.”

Selected seedling of the “Smith.” The plant and fruit are both somewhat bristly, but not nearly as much so as the parent. Niagara never fails to bear at least four to six times as much fruit as the Smith. The fruit, which is of the brightest crimson color is smoother and more compact, larger, with a thinner peel and of far superior quality, flesh crimson throughout. Seeds somewhat abundant, but its enormous producing ability can and will give it a place. The crimson fruits sell most readily.



“Niagara.”

## Other Uses for Spineless Cactus.

First: The fresh fruit of these improved varieties is unique in form and color, exceedingly handsome, unusually wholesome (the large amount of vegetable salts they contain being regarded as very beneficial), and far superior to the banana in flavor. It is usually sold at the same price per box as oranges and can be produced at less than one-tenth the expense of producing apples, oranges, apricots, grapes, plums or peaches. There is never a failure in the crop which can be shipped as safely as the other deciduous fruits. The fruit can be gathered and stored like apples, and some kinds will keep in excellent condition from four to five months. Samples packed in ordinary packing boxes without ice, were shipped to Chicago, New York, Boston and Washington and kept in perfect condition.

Second: Most delicious jams, jellies, syrups, etc., in enormous quantities at a nominal cost, are made from the fruits alone or in combination with other fruits, besides various foods and confections, such as Tuna honey (Miel de Tuna), Tuna butter (Melcocha), and Tuna cheese (Queso).

Opuntias have been used (even the thorny ones), for making confectionery by the Mexicans and others for a long time. Some of the finest candies of Mexico are candied cacti of various forms.

Third: The fat young leaves are sometimes used for pickles, and are a fairly good and wholesome food when fried like egg-plant. They are also boiled and used as greens and are prepared with sugar producing a sweetmeat similar to preserved citron, which may be flavored with ginger or other spices.

Fourth: The abundant mucilaginous juice from the leaves is extracted for mixing with whitewash to make it lasting when exposed to the weather. For the purpose of obtaining this mucilage the leaves are simply cut in thin slices or crushed and placed in water. A leaf or two will make a gallon of good, thick, transparent mucilage of superior tenacity, used on cotton fabrics especially for waterproofing. When this substance dries slowly, it produces a gum which is hard,

brittle, generally white or of a pearly color, and not readily dissolved in water. It should also make a valuable addition for giving more tenacity to some of the compounds used in spraying trees and plants for parasites.

Fifth: The juice from the fruits of the crimson varieties is used for coloring ices, jelly and confectionery; no more beautiful colors can be imagined.

Sixth: The fruits and leaves are sometimes served in various other forms for food by those who are familiar with them.

Seventh: The cactus also gives great promise as a producer of alcohol, paper pulp and leather board, and in Australia is now said to be a thorough success in these respects. It is planted at Alexandria, Egypt, to prevent the drifting of sand.

Eighth: Even if the cactus yielded no product of direct utility, yet it would, on account of its great growth and rapidity of increase, perform a very distinct function in preventing the rain from carrying away superficial layers of soil from barren slopes which the rain waters would surely carry to the sea where would be wasted uselessly this most precious portion of the earth's crust, the portion most rich in elements of fertility. Moreover the cactus facilitates the penetration of the earth by waters which reappear below in the form of springs. It is impossible to repeat too often that, in such countries as Tunis and Algiers, where frequently torrential rains are separated by long seasons of drought, too great effort can not be made to retain in the ground as much as possible of this water which ordinarily trickles away without benefit to agriculture over the numerous barren slopes. It is not necessary to wait until it forms into rivulets before trying to catch it. It is much sooner than this, when the water has as yet formed merely liquid threads which the tiniest obstacle can divert, that the effort should be made to make it penetrate the soil. The cactus planted on cleared strips, worked out according to the contour of the surface, may be advantageously employed to this end.

**LUTHER BURBANK AND HIS WORK**

From the Speech of  
Hon. Everis A. Hayes  
of California

In the House of Representatives

**SPINELESS CACTUS**

No more important thing has recently occurred in agriculture than the successful production of the rapid-growing, edible spineless cactus by Luther Burbank. After 16 years of expensive and costly experimentation he has produced a new and most valuable cattle food for the world. Mr. Burbank does not claim to have discovered the spineless cactus. Some varieties of this plant have been known for years, but without exception they have been non-edible by any animal. For many years it has been the custom in Africa, as well as in those parts of America where it abounds, to feed to cattle certain varieties of the prickly pear cactus after the spines have been burned off. This burning, of course, greatly increases the cost of fodder. The food value of this spiney cactus for stock has been known by cattlemen, who have grown and used it for some years.

Mr. William Sinclair, a successful cattle grower of Texas, writes:

"We find it very poor policy to put the slightest limit on the amount of cactus our cows get. The more they can eat the better they thrive and the more milk they give. There is nothing that sets them back more than a shortage of cactus. If we happen to be short of milk the cause is almost invariably traced to the shortage of cactus."

The following table shows the comparative value of the average cacti, alfalfa hay and gamma, a typical range grass, according to analyses made by the University of Arizona agricultural experimental station:

**In Water-Free Substance**

	Cactus without fruit	Alfalfa hay	Gamma grass
Ash. ....	19.91	5.67	15.11
Protein .....	6.48	12.74	6.99
Fiber .....	10.22	39.04	30.31
Nitro free extract ..	61.48	41.06	45.63
Ether .....	1.83	1.49	1.96

The great desirability of the rapid growing and edible spineless cactus for cattle food has been recognized all over the world. Inspired by the work of Mr. Burbank and by the experiments made by the French government in Algiers, the United States, through the department of agriculture, was several years ago moved to take up the matter of securing spineless cactus. Experts were sent to foreign

countries, and the world was searched that a cactus might be found spineless, or nearly spineless, which would have sufficient nutriment to be valuable as a cattle fodder. From the plants so collected the department of agriculture has been able to produce a cactus sufficiently free from spines and nutritive enough to be of some value for the cattle business. But today, in spite of all its organization and its wealth, the Department of Agriculture has not obtained a cactus that is in any respect the equal of the cactus produced by Mr. Burbank single handed.

Of all stock food, the Burbank Improved spineless cactus is by far the most prolific.

It is adapted to almost any soil where the temperature does not go below 18 degrees above zero, and it will stand a great amount of heat.

Cactus is the only fodder that furnishes green, succulent feed all the year.

Another source of great value in the Burbank improved spineless cactus is its fruit. It is a fall and winter fruit of attractive colors—crimson, scarlet, yellow, white and variegated. It is a sure bearer; a good packer and shipper; very healthful, and of a flavor which many prefer to that of bananas or figs. It contains 8 per cent to 16 per cent of sugar; is a great fattener for hogs and cattle. Poultry also is extremely fond of it.

These make fine jellies, jams and glace fruits and can be used for coloring ices, jellies, confectionery and so forth.

In an experimental way from the Burbank improved spineless cactus paper pulp and wood alcohol have been produced. But the greatest value of Burbank improved spineless cactus will be that it will make highly productive and valuable vast tracts of land now barren because of insufficient rainfall, not only in southern California and Arizona, the natural home of the cactus, but also in South America, Australia, India, Egypt and elsewhere.

For example, at Los Banos, Cal., on the west side of the San Joaquin valley, are large tracts of land practically bare and worth but \$10 \$10 or \$15 per acre. The annual rainfall is about 5 or 6 inches per annum, making the land semi-arid. On this soil, without irrigation, the Los Banos plantation is producing enough, with a few pounds of chopped straw, bran or other roughage, to keep four cows per acre all the year. This same land, when so situated that it can be irrigated and planted to alfalfa, keeps about one cow per acre annually and is now selling for \$200 per acre. In other words, Burbank improved spineless cactus will give \$15-an-acre land a greater earning power than alfalfa on \$200-an-acre land.

A visit to the cactus ranch of Mr. Burbank at Los Banos, above referred to, will demonstrate to the most skeptical the great value of this production of Mr. Burbank.

SAMPLES OF VARIOUS COMMENTS ON  
THE WORK.

"Mr. Burbank's first publication on economic cacti serves to set at rest many groundless suppositions as to the character of the work he has had under way for years on these plants. Some persons forgetting that Mr. Burbank has made up to now no official announcement of his work jumped to the conclusion that he had merely hit upon one of the common nearly spineless forms of *Opuntia Ficus Indica*. Others more dishonest have been offering for sale so-called 'Burbank's Thornless Cactus' despite the fact that not a single plant or seed of Mr. Burbank's new creations has left his grounds up to a few weeks ago.

"Mr. Burbank was perfectly well aware of the inception of his work on the opuntias that there were many forms nearly thornless and he has even brought to light one kind, which he calls the 'Marin,' grown in many countries that has neither spines nor spicules. The Marin is not of much value, however, as it is a rather small plant and is not hardy. The new forms are much more rapid growers and are also more hardy."

—Dr. Walter T. Swingle, U. S. Dept. of Agriculture, Washington, D. C.

Consulado General de Mexico,  
San Francisco, Cal.

Hon. Luther Burbank, Santa Rosa, Cal.

Honored Sir: I beg to offer you my profound acknowledgments for your kindest authorization to have your announcement of the spineless cacti translated into Spanish by Professor Luis A. Beauregard, Director General of Public Instruction of Campeche, Mexico.

I have sent to the professor a textual copy of your honored letter.

I have, sir, the honor to be

Your most obedient servant,

P. ORNELAS.

"That the millions of acres of desert land overgrown with cactus may be made a source of large revenue seems almost incredible, but stranger things have happened. Unless Burbank be badly mistaken the spineless cactus is destined to become one of the most useful of plants, furnishing abundance of food for man and beast in regions which have been regarded as too sterile and desolate for any form of stock raising or farming. And the profitable conversion of the common form of the plant into alcohol seems even better assured."—"The Sacramento (Cal.) Bee."

BURBANK CACTUS IS A GOOD  
FODDER

"BERKELEY, Feb. 8.—Experiments just completed by M. E. Jaffa, head of the department of nutrition and foods at the University show that the new species of thornless cactus has properties as fodder for cattle which will equal many of the desert grasses. The tests were made at the request of Luther Burbank, the originator of the new species of plant, and have proved to the full the great importance of the new plant as a fodder for cattle in the waste lands. Professor Jaffa's report on the experiment has just been completed and will be forwarded to Burbank in a few days.

"A short time ago five species of the plant were sent to the agricultural station here to determine the food value. The series of experiments carried on by Professor Jaffa show that the new plant carries nutritive powers which equal three-quarters of that of alfalfa."—"The Berkeley (Cal.) Independent."

"It can be safely said without fear of contradiction that the prophecies of Luther Burbank regarding spineless cactus are being fully realized—and that it is now taking its place at the head of all forage plants as a stock and dairy feed in our western arid and semi-arid states, as well as poultry feed and a luscious fruit for our tables, second to none."

"It is the conviction of the writer that in no home on this, our earth, is there any one being who is exercising a more potent influence for the good of his race than Luther Burbank. For in his work he is guided by the highest principle of benevolence, the training of each individual to perform its best."—"Opinion," Rockland, Me.

SUGAR FROM PRICKLY PEARS

At the instance of the Queensland Government experiments have been made with the prickly pear for the extraction of sugar, and it is claimed that two tons of prickly pear yield as much sugar as three tons of sugar cane and of an equally good quality.—American Review of Tropical Agriculture, Mexico City, Mexico.

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