CONCERNING CANAIGRE.

Production and Preparation—Popular Views Corrected.

Method of Extracting the Tannin—Chance of Fair Profit for Farmers Favorably Located.

San Francisco Chronicle.

Considerable attention is being paid by the press to canaigre as a plant, the cultivation of which may become profitable in this State, and it seems probable that it may become one of the valuable minor industries. The facts, however, do not justify such statements as the following, which are taken almost at random from the country exchanges of one day:

"The wild plant produces ten to twenty tons per acre, which can be increased by cultivation to twenty to sixty tons."

The fact is that its yield in the wild state is unknown, and it has not yet been cultivated on a commercial scale, but the root is smaller than the sugar beet and the yield will be less; probably in good, fresh soil ten or twelve tons per acre.

"The market for the root is practically unlimited." As a matter of fact it has no market to speak of, is not quoted in any price current, and has yet to fight its way into use in the face of other tanning material now holding the trade. Nor is there any "practically unlimited" market for any agricultural product.

"Millions of acres will soon be devoted to canaigre." The annual product of even 1,000,000 acres would be 10,000,000 tons, which would make over 500,000 tons, or 77,000 carloads, of the dried extract, a quantity which could not even be given away.

"Any farmer can raise it and be independent of any near-by factory." This is entirely untrue, as will be shown later. The root must be cultivated, like sugar beets, in connection with a factory.

False or foolish statements like the foregoing can only injure any proposed industry. The culture of Canaigre may prove profitable to those favorably situated, and the matter is of sufficient interest to justify the publication of the facts. There are three points to be considered—cost, market and competition. This article will be devoted to cost, and the facts upon which it is based have been obtained from Professor E. W. Hilgard of the University of California and Dr. Julius Koebig, consulting chemist of San Francisco, who was among the first to call attention to the value of the plant, and who has followed with interest the efforts to utilize it. Dr. Koebig has revised this article.

Canaigre is a winter-growing dock, indigenous to arid America. Like other docks, it is a vigorous fighter for food, which it rapidly exhausts, and its continued cultivation would involve early sterilization, which, however, its own refuse would largely supply. Its winter-growing habit shows its preference for a cool climate, with moderate moisture, and renders its success in the hot summer growing time of our Eastern States very doubtful. It is, however, being tried there, and we shall soon know. It thrives at Berkeley, and an analysis of the root grown there shows a higher percentage of tannin than that produced in Arizona. Professor Hilgard can account for this by the cooler climate. One or two experiments, however, do not settle such things, and further analyses will be required. This is very important, as within a few years more canaigre will probably be produced than can be readily sold, and the price will be fixed by its cost of production in the districts showing the greatest yield.

The extract, when properly prepared, contains, of liquid, about sixty-five per cent of tannic acid, and if dried about seventy-five per cent, and in that form contains no substances deleterious to the tanning process, and makes excellent leather. Canaigre can be used for tanning only in the form of an extract because of the presence of starch in the dried root, which makes a paste on the hides and prevents the tannin from reaching the pores. The extract must be made either at the place of production or place of consumption.

There has as yet been no cultivation of the plant on a commercial scale. The people of Arizona have been digging the wild root, slicing, drying and making some market for it, mostly in Glasgow, where there are appliances for making the extract. There is an extract factory at Deming which is finding a market for its product in Eastern cities, with, doubtless, some exports of experimental lots. The officials of the Southern Pacific company state that there has been quite a movement of the product, but no such amount as the papers report. The freight from Eastern Arizona is $5 per ton to Eastern cities and $15 to Glasgow, and must always be lower from there than from California. The supply of the wild root within gathering distance of the railroad is becoming exhausted, and the problem of its profitable production now presents itself.

Presumably the green root can be raised in suitable soils, which would be the light, but good land suitable for other root crops, for about $4 per ton. This is about the average price of sugar beets, and this is probably what the farmer may expect delivered. As the best raiser is paid more or less for his beets according to their sugar test, so in this case the grower would be paid more or less according to the tannin contained. If at the beginning the prices were high, increased acreage would rapidly bring it down. The cost to the producer would be similar to the cost of other root crops, and would depend on the character of the soil and the cost of delivery to the factory. As compared with sugar beets, the cost might be less, as there is no thinning, although the hand planting of the canaigre roots would be more expensive than the machine sowing of the beets.

To begin with canaigre never should be dried, and it never will be when the business assumes commercial proportions. It is true that wild canaigre roots have been sliced, dried and sold in limited quantities, but that practice will disappear wherever its culture is seriously entered upon. Nobody wants the stuff except for experimental purposes, since it has no reliable percentage of tannin. If dried by the producer it would have to be soaked at the point of consumption in order to extract the tannin. The dried article would never stand the cost of transportation. It has been claimed that the dried root is worth $40 per ton at Glasgow. Perhaps it is. Assume it any way, and suppose the freight to be the same as green dried fruit, which is $25 to New York, and probably about $16 to Glasgow, leaving $15 to the grower if no middleman intervened, which is a practically impossible condition.

It takes three tons of green root to make one of dried, so that $40 per dry ton at Glasgow would yield $4 per green ton to the grower, not to show one ton of green root and dry our therefrom sixty-six tons of water and sack the dried product will certainly cost more than to take from two tons of fresh prunes sixty tons of water without slicing and sack the dried product. The latter we know cannot be done for less than $4 per ton, so that with dried canaigre at $40 per ton in Glasgow the California producer, with no middleman, might get paid for his sacks and labor in drying, but would get nothing for the roots. As the traffic evidently would not bear this rate of transportation, doubtless a lower rate would be forthcoming, but if divided in half the net result would be but about $4 per green ton to the grower, less middlemen's charges which could not be less than 3 per cent, and might be more.

We now reach a proposition involving a reasonable expectation of fair profits to those favorably situated, and perhaps an important source of wealth to the State, but nothing involving extravagant prophecies. The process of extracting the tannin from canaigre is the same as that of extracting the sugar from beets, minus the expensive and delicate chemical process for refining. This process includes:

First—Slicing the roots by machinery.

Second—Pacing them, usually by gravity, in wooden tanks called "diffusing batteries," through which water is passed at a temperature not exceeding 100 degrees Fahrenheit, until the tannin is extracted, while the starch remains.

Third—Boiling the tannin-charged water in a copper vacuum pan to the consistency of a syrup containing about 65 per cent of tannic acid, with a residue not injurious to the tanning process.

In this condition transportation has to be paid on only one ton of useless matter for every two tons of tannin. So far as we now know, this is cheaper than to extract the pure tannin, but the weight may be still further decreased by exposing the thick syrup in a dryer at a moderate temperature and making the extract solid, in which state it would contain about 75 per cent tannin, and the transportation of waste matter would be only about one ton in four.

Throughout the process comparatively low temperatures must be preserved, as heat tends to decompose the tannin, especially when exposed to the air. This necessitates the use of the vacuum pan, in which evaporation takes place at low temperatures. This fact also indicates the probability of the most successful results in the equable and not too wet climates of our central and southern coasts.

The cost of a plant for extracting the tannin from canaigre is reduced by the fact that there is no special harvest time for the root, which keeps perfectly in the ground for years, and can be gathered at any time after full growth, so that the harvest can go on throughout the year. The cost of a plant to take care of the product of, say 4,000 acres, to be sliced, say 300 days in the year, at the rate of 100 tons of root per day, would be about as follows:

Slicing machine, etc.	$200
Diffusing battery of four tanks, with piping and fittings	2,500
Copper vacuum pan, with set pump and fittings	2,500
Carrier and appliances for conveying sliced roots to tanks	250
Piping and receptacle for liquid before boiling	250
Dryer	1,000
Total special plant	$6,700

The above are not estimates, but merely intelligent guesses not far enough out of the way to make any difference for the purposes of the article. To the above must be added a fifty horse-power boiler and a twenty horse-power engine, with the necessary land, buildings and minor appliances, and a reasonable sum for working capital, making a total investment of from $20,000 to $25,000.

To operate the establishment there would be necessary a superintendent, who must be a fair chemist, an engineer, and a working force sufficient by the aid of machinery to handle and treat 100 tons of roots per day and pack the finished product, in all probably a force of fifteen to twenty men. The larger the establishment the more economically it could be managed.

In the absence of data, we can compare the process with the cost of treating sugar beets which we know, in large establishments is not to exceed $1.25 per ton. With the chemical processes necessary to refining sugar omitted, and a factory running all the year round, the cost of treating the canaigre root should not exceed $1 per ton, even in the comparatively small establishment proposed, which, at $4 per ton for the green root, and an average content of 7 per cent tannin would give a cost of $25 per ton for the dried extract, 75 per cent pure. To such an estimate as this, certainly 25 per cent should be added for contingencies, or say, in round numbers $30 per ton at the factory, which price will be assumed as the cost in discussing the question of markets and competition hereafter.

AN HONEST MAN.

"When I first entered upon my duties as President," said Mr. Lincoln, grasping one arm of his pocket-rule vest with each of his long, bony hands, while he ran his fingers through and brushed back his shaggy black hair, "I fully came up my mind to appoint to office none save whom I knew to be honest and who had suitable ability. In any event, honesty should be the prerequisite, so the lack of a little ability might be easily made up by an honest man endeavoring to do his whole duty conscientiously. While this resolve was fresh upon me, there came to visit me a very old friend, a minister who had traveled so fast that he had not yet shaken the Illinois mud roads off his capacious boots.

"'Why, what brings you here, Mr. Shuffle?' (Which was not his name, but it will do just as well.)

"'Well,' he replied, 'I came down here, Brother Lincoln, to get an old fashioned shake of the hand, and, secondly, to say that the folks of my congregation are so poor that they can hardly afford me a decent living, and I thought maybe you would give me some sort of an office that would pay me better.'

"'Certainly,' I answered quickly, for I knew he was an honest man, and I was looking for stock of that kind. 'Have you in view any particular office?'

"'No,' said the Rev. Mr. Shuffle complacently. 'I would not know what to choose if you were to hand me a list to choose from.'

"'Nor I what to give you, but I will tell you who will help you out. You know Colonel Chessbgee of our county. He is now on duty in the treasury department. Go and see him. He is a man of resources, and will put you out of your difficulty. Come back tomorrow and report.'

"The next day, according to promise, Shuffle put in an appearance, and said that the colonel had recommended him to apply for a certain position in the revenue department.

"'What is the salary?' said I, signing in a mechanical way a pile of commissions.

"'Two thousand dollars a year.'

"'Well, do you think that enough? I may be able to do better for you.' I knew he was an honest man and thought he might just as well as not get a place where he could earn more money.

"'Oh, plenty, Uncle Abe, for that is more than double the amount I've been earning for years past.'

"'Now I begin to think,' said our martyr president, 'that I would have to force him into a plow paying a larger salary and where government would have a corresponding return for his valuable services, for I was more than ever—if that were possible—convinced that he was an honest man. But I finally concluded to give him his own way, and he was appointed accordingly. Off he went rejoicing, but I felt rather mean at my one horse gift to my good, honest, reverend friend.

"Three years elapsed, and the assassins attending the war had completely driven from my mind, for the time being, the incident just related, when my messenger brought me a card bearing the familiar name 'Rev. Adam Shuffle.' And immediately there flashed across my mind all the circumstances attending my appointing him to office. I directed him to be shown in, and in walked, with creaky boots, one of the best and finest dressed men I had seen in many a day. I recognized his countenance at a glance, but it was his marvelous clothes that troubled me. They sat easily enough upon his body, but somehow or other they did not sit so easy on my mind. But wherefore I could not for the life of me tell, if I had tried, which I didn't.

"'Good morning, Mr. President'—no longer Uncle Abe, as before—said he in a sort of grandiloquent manner. 'I hope you are well and getting on nicely.'

"'Oh, yes,' said I. 'We poor folks who eat a living after a fashion.' Intending to give him the hit in his mouth, for I knew what an honest man he was and how much—I couldn't tell then exactly how much, for I had lost the run of him—we were indebted to him.

"'Mr. President, I have come to resign my office.'

"Feeling somewhat as though I had been struck by lightning, I managed to exclaim, 'Indeed!'

"'Yes. I feel that there are many others deserving of the place, and that it is my duty to make way for them.'

"'Was there ever such an honest man as that?' said I to myself, chuckling over my stupidity on the clothes surprise. 'Hist,' said I, aloud, 'I'm afraid you are not considering yourself. Friend Shuffle, and that when you go back to preaching you will be as hard up as when you came here three years ago. Hadn't you better hold on a little longer, say a year more, and let us both go out of office together?'

"'No, thank you. I am going to Europe during that time, but I hope to see you here, as president, when I return,' and, after a few more kind expressions off went Rev. Shuffle.

"About a month after, one of the reverend gentleman's neighbors paid me a visit, and, among other things, remarked casually that I had 'done a pretty good thing for Shuffle.'

"'Yes,' I replied, 'I gave him a $2,000 a year position for three years.'

"'Besides the balance?' added my visitor. 'Why, if he's worth a cent, he is worth today $200,000, and I can prove it if necessary.'

"What could the hint mean? To satisfy myself of the falsity of the charge, I sent detectives to where he lived, and they brought back word that he had made his $6,000 salary in the aggregate yield fully $200,000—but then I knew he was an honest man, and there must be a mistake somewhere here!"

"By the way," added Mr. Lincoln, with one of his knowing winks. "We have plenty of '94-silver left, but the mischief of it is it is hard finding them out, and they are not considerate enough to resign, as did our honest friend Shuffle."—True Flag.

Food and Eggs.

One common mistake in the business is the idea that it is the quantity of good food and not the variety that affects the laying, and that if a hen is given any food which supplies all the component parts of the egg nothing more is necessary. Yet these same persons will welcome for themselves a change to a less nutritious diet. Even the best food at times palls on the appetite. Fowls must be kept in good health if they are to continue laying. Any system of feeding is expensive if the hens do not lay, and the greater the number of nonproductive hens the more cost is added to the eggs received. This is a case where money is often lost for lack of thought.

Poultry Notes.

Sunflower seed add luster to the plumage.

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The Pekin ducks develop early and are good market fowls.

Geese thrive on plenty of good pasturage and plenty of water.

Train the young poultry to roost in the poultry house from the start.

It does not pay to be economical by starving the young growing fowls.

A pound of copperas dissolved in two gallons of water makes a good disinfectant.

If ducklings are exposed to wet weather, they are apt to take cramps in their legs.

The laying of unusually large eggs denotes that the hens are in an overfat condition.

Mixing Scotch snuff or insect powder in the dust bath will help to rid the fowls of lice.

The sooner the hens get through their molting the sooner they will begin laying again.

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It is well to remember that as the chickens grow and increase in size they will need room.

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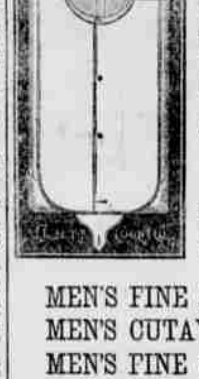

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1895-6.

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PRESIDENT JOSEPH F. SMITH will instruct and interest our readers with some articles descriptive of

Early Days in the Valley,
Which will contain reminiscences of his valuable though oftimes trying experiences as a boy and man in Utah.

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Ideal Manhood: Some Suggestions About It.
This will be the title of some articles containing valuable suggestions to our young men who have an ambition to do or be something in the world. The author is a long resident of Utah, but desires his identity concealed and will consequently write under the *nom de plume* of SIMPLEX.

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