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METHOD OF OBTAINING LEAF TOBACCO WITH LOW CONTENT OF NICOTINE

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U.S. Cl. 47—58 1 Claim

ABSTRACT OF THE DISCLOSURE

An aqueous solution or aqueous suspension of a film-forming agent is spray-spread on the surfaces of tobacco leaves after the stopping of field-grown tobacco, to form an insoluble thin film thereon. As a film-forming agent there may be used higher alcohols having 16 to 22 carbon atoms in the molecule and their derivatives; animal, vegetable and mineral waxes; high polymers or substances which are generally as a vehicle.

This application is a continuation of Ser. No. 654,082, filed July 18, 1967 and now abandoned.

BACKGROUND OF THE INVENTION

(1) Field of the invention

The present invention relates to a method of obtaining leaf tobacco with low content of nicotine. More particular, this invention relates to a method for the treatment of leaf tobacco wherein the surface of the leaf is coated with a film-forming material after the ripe stage of field tobacco.

(2) Description of the prior art

As hitherto known methods for lowering the nicotine content of leaf tobacco, there may be mentioned, for instance, the cultivation of low nicotine varieties, the reduction in the amount of nitrogen fertilizer used, the dense cultivation of tobacco, and others. However, these known methods have in practice disadvantages because they effect undesirably on the yield and quality of leaf tobacco.

BRIEF SUMMARY OF THE INVENTION

The present invention is intended to obviate such disadvantages in conventional known methods.

An object of this invention is to provide an improved method for economically obtaining leaf tobacco having low nicotine content and good quality.

According to the present invention the nicotine content in the leaf tobacco can be decreased and moreover, its quality can be improved by spray-spreading an aqueous solution or aqueous suspension of film-forming agent on the surfaces of tobacco leaves after the topping of field-grown tobacco to form a thin film thereon, thereafter priming said leaves at the proper mature stage in a usual known method and then drying the leaves thus obtained.

DETAILED DESCRIPTION INCLUDING PREFERRED EMBODIMENTS

The film-forming agent used in the present invention is an agent which has such effect that it may form an insoluble thin film on the surface of body when it is spread thereon in the form of aqueous solution or aqueous suspension.

As a film-forming agent, there may be used, for instance, an aqueous solution or aqueous suspension of

higher alcohols having 16 to 22 carbon atoms in the molecule, such as cetyl alcohol, stearyl alcohol, eicosyl alcohol and docosyl alcohol and their derivatives; waxes, such as carnauba wax, cotton seed wax, beeswax, wool wax, paraffin wax, montan wax, microcrystalline wax; and high polymers, such as polyvinyl acetate, polyvinyl alcohol and the like. In addition, substances which are generally used as vehicle may be employed, for instance, polyoxyethylene dodecyl ether, alkylphenol polyethylene glycol ether, polyoxyethylene alkylary ether and lignin sufonate, for example, sodium lignosulfonate.

The mechanism in the reduction of nicotine content resulted from the spreading of the above described film-forming agent may be believed as follows:

As well known, the stomata of tobacco leaves lose the ability of opening after the mature stage of leaves and consequently, the O_2-pressure in the intercellular spaces of leaves tends to decrease to the state in which the anaerobic respiration proceeds. When the whole surfaces of tobacco leaves are spread with a film-forming agent in that period, films thus produced cover the surfaces stomata of the leaves so that the lack of oxygen is brought on nd hence the anaerobic respiration is promoted actively. When the anaerobic respiration is conducted, the bonding of nicotine to organic acid is cut and a part of bound nicotine is liberated. Due to the strong volatility, the liberated nicotine is scattered from the surfaces of green or drying leaves into the air, and thus, the nicotine content in the leaf tobacco may be decreased.

In the present invention, the above described film-forming agent is preferably spread on the leaf tobacco by use of sprayer and the like in the form of aqueous solution or aqueous suspension having in general a concentration not more than 3%. In that case, it should be careful that said agent is spread on the outer and rear or back surfaces of the leaf in such a manner that an insoluble film can be formed completely without unevenness.

The stage at which said film-forming agent is spread on the leaf tobacco is preferred to be after the topping of field-grown tobacco. Further, with regard to the frequence of spreading said film-forming agent, although the more the frequence is, the greater effects on the nicotine content and the price per kg. are provided, spreading more than three times is not advantageous economically from the point of labour.

The same result may be obtained in the present invention by dipping the primed tobacco leaves in a solution of film-forming agent and drying them before flue-curing. In this case, the concentration of dipping solution is preferred to be not more than 5% and desirably somewhat higher, as compared with that in the spreading. The dipped tobacco leaves may be flue-cured by a conventional method after drying of the agent.

For the tobacco leaves thus treated, the improvement in the quality, such as the lower nicotine content and higher price per kg. is observed remarkably.

Thus, the improved method according to the present invention gives really a great contribution to the tobacco industry.

In the following, this invention is further described with reference to examples which are illustrative but not limitative thereof.

EXAMPLE 1

(1) Preparation of agent

15 parts of carnauba wax and 5 parts of microcrystalline wax were mixed and the mixture was molten with heating. A solution containing 1 part of sodium oleate, 5 parts of morpholine and 2 parts of tricresyl phosphate dissolved in 70 parts of water was then added to said molten mixture gradually with heating and stirring to emulsify. The resulting emulsion was diluted to twelve

times of its original volume with water to prepare a spreading agent.

(2) Spreading process

The field grown tobacco, the variety Hicks, was topped at the flowering stage and the above-mentioned agent was spread evenly on the outer and rear or back surfaces of leaves at a rate of 180 ml. per plant by means of sprayer. In the A-section, the agent was spread once immediately after topping (A-section) and in the B-section, it was spread two times immediately and 9 days after the topping (B-section).

(3) Investigation of quality (price per kg.) and nicotine content

When tobacco plants reached to the mature stage, the leaves were primed and flue-cured. The cured leaves were gathered according to the positions and characters of leaves, and their values were then graded. The nicotine content was investigated as percent to the dry matter for 20 dried outer and rear leaves of the highest grade, and the value was illustrated as the average of the whole products. The result is shown in the following table.

	Nicotine content (by wt. percent)	Yield of dried leaves per 10 a., kg.	Price per kg. (index)
Section:			
A	1.87	288.0	108
B	1.56	256.7	117
Control	2.55	287.0	100

EXAMPLE 2

(1) Preparation of agent

3 parts of sodium oleate were added to 5 parts of monooxyethylene stearyl alcohol and 5 parts of monooxyethylene docosanol and the resulting mixture was heated to melt and dissolved in 100 parts of warm water to produce an emulsion, which was then diluted further to twelve times of its original volume with water to form a spreading agent.

(2) Spreading process

Bright Yellow, a flue-cured variety of tobacco cultivated on the field was treated. The above agent was spread at a rate of 120 ml. per plant according to Example 1: once immediately after topping (C-section) and two times immediately and a week after the topping (D-section).

(3) Investigation of quality (price per kg.) and nicotine content

The investigation was carried out as in Example 1 and the result is shown in the following table.

	Nicotine content (by wt. percent)	Yield of dried leaves per 10 a., kg.	Price per kg. (index)
Section:			
C	1.57	242.2	99
D	1.24	266.5	119
Control	1.26	226.3	100

EXAMPLE 3

(1) Preparation of agent

A commercial vehicle containing 10% of polyoxyethylene alkylarylether and 20% of sodium lignosulfonate was diluted with water of 750 times of its volume to produce a spreading agent of 0.04% content.

(2) Spreading process

The field-grown Bright Yellow was tested and the aforesaid agent was spread 15 days after the topping once at a rate of 330 ml. per plant in the same manner as in Example 1 (E-section).

(3) Investigation of quality (price per kg.) and nicotine content

The investigation was carried out according to Example 1 and the result is shown in the following table.

	Nicotine content (by wt. percent)	Yield of dried leaves per 10 a., kg.	Price per kg. (index)
Section E	2.07	193.0	109
Control	2.46	196.0	100

EXAMPLE 4

(1) Preparation of agent

1 part of emulsifier (polyoxyethylene alkylether) and 90 parts of warm water were added to 10 parts of polyvinyl alcohol having the degree of polymerization of 1,000 to 1,500 and the mixture was stirred to produce an emulsion, which was then diluted further with water to form a spreading agent of 1% content.

(2) Spreading process

The above agent was spread 10 days after the topping of Bright Yellow once at a rate of 150 ml. per plant in the same manner as in Example 1 (F-section).

(3) Investigation of quality (price per kg.) and nicotine content

The investigation was carried out according to Example 1 and the result is shown in the following table.

	Nicotine content (by wt. percent)	Yield of dried leaves per 10 a., kg.	Price per kg. (index)
Section F	1.97	232.0	111
Control	2.44	234.5	100

What is claimed is:

1. In a method of obtaining field-grown leaf tobacco wherein the field-grown tobacco is topped and the leaves subsequently primed and dried, the improvement which comprises reducing the amount of nicotine in the dried leaves by spraying the plants in the field after topping at least once with an aqueous composition consisting essentially of not more than about 3% by weight of at least one film forming agent to form a thin film of said agent over substantially the entire leaf surface, said film serving as a gas impervious barrier to inhibit aerobic respiration, said agent being selected from the group consisting of carnauba wax, cotton seed wax, beeswax, wool wax, paraffin wax, montan wax, microcrystalline wax, cetyl alcohol, stearyl alcohol, eicosyl alcohol, docosyl alcohol, monooxyethylene derivatives of said alcohols, polyvinyl alcohol, and polyvinyl acetate.

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