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(12) **United States Plant Patent**
Zimmermann

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(54) **HOP PLANT NAMED ‘YCR ACCESSION NO. 14’**

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(*) **Notice:** Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

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(52) **U.S. Cl.** **Plt./236**

(58) **Field of Search** **Plt./236**

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(57) **ABSTRACT**

A new hop plant variety is disclosed. The new variety is used for its bittering and aromatic properties. The new variety is moderately tolerant to powdery mildew and Sphaerotheca. The new variety produces a medium size compact cone with good pickability and storageability. The cones mature early, and yield a crop of 2650 to 2880 pounds per acre (2970 to 3230 kg/ha).

6 Drawing Sheets

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BACKGROUND AND SUMMARY OF INVENTION

This invention relates to a new and distinct variety of hop plant, and more particularly to a new hop plant variety of unknown parentage which was discovered among plants created as part of a controlled breeding program. The new variety has been stably reproduced over successive generations. Discovery of the new variety and initial reproduction by root cuttings was carried out in a research nursery in Prosser, Wash., U.S.A. Subsequent asexual reproduction took place in Granger, Wash., U.S.A.

THE DRAWINGS

FIG. 1 shows a hop cone of the new hop plant variety;

FIG. 2 shows a cluster of hop cones of the new hop variety;

FIG. 3 shows a cluster of hop cones of the new hop variety;

FIG. 4 shows a blossom and leaf of the new hop plant variety;

FIG. 5 shows a bine of the new hop plant variety; and

FIG. 6 shows a hop plant of the new variety.

DESCRIPTION OF THE VARIETY

The new hop plant variety is a cultivar of recent origin, used for its bittering and aromatic properties. The new variety is moderately tolerant to powdery mildew and Sphaerotheca. The new variety produces a medium size compact cone with good pickability (similar to Cascade, unpatented) and storageability (25% to 30% alpha loss after 6 months common storage). The cones mature medium early (about September 1 in Granger, Wash., and yield a crop of 2650 to 2880 pounds per acre (2970 to 3230 kg/ha).

The following is a detailed botanical description of the new and distinct variety of *Humulus lupulus*, based on observations of specimens grown in Granger, Wash. during the 1998 growing season. All colors are described according to The Royal Horticultural Society Colour Chart. It should be understood that the botanical and analytical chemical characteristics described will vary somewhat depending

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upon cultural practices and climate conditions and can vary with location and season.

Bine:

Color.—Yellow green (146C).
Stripe.—Greyed purple (183A).
Stipule color.—Light green.
Stipule direction.—Up, forked.
Diameter.—0.80 cm (measurement taken at 2.75 m).
Shoot emergence.—Medium early to medium; similar to Galena.

Leaves:

Leaf arrangement.—Opposite.
Leaf shape.—Cordate to palmate.
Average length.—17.3 cm.
Average width.—17 cm.
Color — upper surface, mature.—Green (139A).
Color — lower surface, mature.—Green (137B).
Color — upper surface, immature.—Green (137A).
Color — lower surface, immature.—Green (137C).
Number of leaf lobes.—1–5.
Margin.—Serrate.
Serrations per inch.—4 min., 7 max.
Pose.—Downward.
Average petiole length.—8.0 cm.
Petiole color at base.—Greyed purple (183A).
Venation.—Palmate.
Vein color.—Yellow green (146C).

Cones:

Average length.—2.8 cm.
Average diameter.—1.5 cm.
Color.—Bract: Yellow green (144A). Bracteole: Yellow green (145C).
Shape.—Ovoid.
Bract shape.—Ovate.
Bract tip shape.—Acute.
Bract tip position.—Appressed.
Bracteole shape.—Lanceolate.
Shattering potential at harvest average for commercial varieties.—Similar to Cascade.
% Alpha acids.—12.0%–14.0% of cone weigh (ASBC Spectrophotometric method).

% *Beta acids*.—4.0%–5.0% of cone weight (ASBC Spectrophotometric method).
% *Cohumulone*.—15.0%–20.0% of alpha acids.
Total oils.—2.0–2.5 mL/100 g.
Aroma.—Sharp, floral with spicy notes.
Analytical data: Essential oil profile of YCR Accession No. 14: 110 mg of 10% Adsorbate/150C/5 Min. by DTD-GC-MS.

MS Spec #	Area Integration	Peak Assignment	Area %
77–246	39360	acetone + isoprene	0.484
306–322	7766	2-methyl-3-buten-1-ol	0.096
336	1454	pentanal ?	0.018
352	266	hexene	0.003
389	850	formic acid	0.010
396	6832	acetic acid	0.084
422	488	methylpentanone	0.006
430	932	?m/z 56, 70 peaks	0.011
457	2767	3-methyl-2-butenal	0.034
471	1795	hexanal	0.022
478	3315	isobutyric acid	0.041
489	3359	n-octane	0.041
539	11204	3-methylbutyric acid	0.138
545	2082	2-methylbutyric acid	0.026
548	972	2-methyl-2-butanol acetate	0.012
555	301	? m/z 82/81/67 peaks	0.004
561	245	? m/z 81 peak	0.003
565	738	propanoic acid	0.009
579	26435	4-penten-2-ol + 2,6-dimethyl-2,4-heptadiene	0.325
592	4135	5,5-dimethyl-2(5H)-furanone	0.051
603	980	alpha-pinene	0.012
611	128	propylisobutyrate	0.002
617	1236	dimethyltrisulfide	0.015
626	9978	2-methylbutylpropanoate	0.123
634	235	6-methyl-5-heptene-2-one	0.003
638	15055	beta-pinene + hexanoic acid	0.185
652	1521624	myrcene	18.728
655	9934	2,7-dimethyl-2,6-octadiene	0.122
663	26663	isobutyl-2-methylbutyrate	0.328
667	31112	3-methylbutylisobutyrate	0.383
671	19675	methylheptanoate	0.242
674	200	alpha-terpinene	0.002
677	418	p-cymene	0.005
685	10340	limonene + beta-phellandrene	0.127
690	244	? terpene	0.003
698	4618	beta-oclmene + pentyl-2-methylpropanoate	0.057
712	584	gamma-terpinene	0.007
717	1726	Isooctanol	0.021
728	8437	heptanoic acid	0.104
733	31157	methyl-6-methylheptanoate + 2-nonanone	0.383
738	1362	linalool oxide	0.017
747	34668	linalool + nonanal + 3-(4-methyl-3-pentenyl)-furan	0.427
752	8440	2-methylbutyl-2-methylbutyrate	0.104
756	9488	pentyl-3-methylbutyrate	0.117
762	292	? terpene	0.004
769	34847	methyloctanoate	0.429
775	1026		0.013
779	3860	2,3-dihydro-3,5-dihydroxy-6-methyl-4(H)-pyran-4-one	0.048
790	5801	octanoic acid (branched isomer)	0.071
797	1219	hexylisobutyrate	0.015
800	312	cis-3-hexenylisobutyrate	0.004
802	614	2-decanone (branched isomer)	0.006
806	220	2-decanone (branched isomer)	0.003
815	492	? terpene m/z 41/69 peaks	0.006
829	27744	? 130 m.w.branched alcohol m/z 59 base peak + octanoic acid	0.341
836	1313	? terpene m/z 41/69/152 peaks	0.016
841	13019	2-decanone	0.160
846	6935	methyl-4-octenoate	0.065
852	241		0.003

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MS Spec #	Area Integration	Peak Assignment	Area %
858	1223	heptylpropanoate	0.015
864	4438	methylnonenoate	0.055
881	24061	methylnonanoate	0.296
886	2321	nerol	0.029
892	460		0.006
899	235		0.003
904	531		0.007
910	2019	2-methylheptylpropanoate	0.025
915	66621	geraniol	0.820
918	18565	2-undecanone (branched isomer)	0.228
925	1264	? terpene m/z 41/69 peaks	0.016
939	20854	undecenyl alcohol	0.257
950	1126	octenyl acetate	0.014
955	166	? 180 m.w., 95 base peak, possibly bornylformate	0.002
963	101264	methyldecanoate (branched isomer) + 2-undecanone	1.246
978	920	octylpropanoate	0.011
963	160309	methyl-4-decenoate + methyl-4,8-decadienoate	1.973
996	51491	methylgeranate	0.634
1004	40310	methyldecanoate	0.496
1016	1736	decanoic acid (branched isomer)	0.021
1034	6140	octyl-2-methylpropanoate	0.076
1039	958	? unsaturated alcohol or aldehyde	0.012
1050	14056	2-dodecanone (branched isomer)	0.173
1057	6412	alpha-cubebene	0.079
1064	6428	decanoic acid	0.079
1073	3240	geranyl acetate	0.040
1078	1933	? acetate	0.024
1082	23	possibly bornylacetate	0.000
1087	6203	alpha-ylangene + methylundecanoate (branched isomer)	0.076
1092	29196	alpha-copaene + 2-dodecanone	0.359
1107	2850	? 204 m.w. sesquiterpene	0.035
1113	3500	methylundecadienoate	0.043
1123	1495	methyl -10-undecenoate	0.018
1129	1024	? sesquiterpene 206 m.w. 163 base peak	0.013
1135	2161	methylundecanoate	0.027
1151	1612921	caryophyllene	19.852
1159	33311	beta-cubebene	0.410
1164	835		0.010
1169	1805	? sesquiterpene 206 m.w. 163 base peak	0.022
1180	5290	2-tridecanone (branched isomer)	0.065
1196	3160413	humulene	38.898
1200	2148	? 204 m.w. sesquiterpene 161 base peak	0.026
1204	350	methyl-dodecenoate	0.004
1215	67631	gamma-muurolene	0.832
1224	45481	2-tridecanone	0.560
1230	24862	metyldodecenoate (branched isomer)	0.306
1238	176494	methyl-3,6-decadienoate	2.172
1246	53191	geranyl isobutyrate + alpha-selinene (scan 1242)	0.655
1251	20079	methyl-dodecenoate + delta-cadinene	0.247
1262	64843	alpha-muurolene	0.798
1266	2064	calamenene	0.025
1273	95640	beta-cardinene	1.177
1276	1865	delta-selinene	0.023
1285	10335	sesquiterpene w/no common name CAS#16728-99-7, cadinene-type	0.127
1292	11255	? sesquiterpene 200 m.w. 157 base peak	0.139
1308	10505	dodecatrienic acid	0.129
1318	12734	tetradecadienol	0.157
1332	1349	caryophyllyl alcohol	0.017
1342	19979	caryophyllene oxide	0.246
1348	2006	methyltridecadienoate	0.025
1356	12300	2-tetradecanone + methyl-tridecenoate + humulene epoxide	0.151
1367	2300	methyltridecenoate	0.028
1373	34158	humulene epoxide	0.420
1379	247		0.003

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MS Spec #	Area Integration	Peak Assignment	Area %
1384	2559	? sesquiterpene m/z 204/179	0.031
1390	231	? 222 m.w. sesquiterpene	0.003
1399	11574	globutol	0.142
1411	15578	delta-cadinol	0.192
1429	35634	pentadecatrienol	0.439
1436	821	2-pentadecanone (branched isomer)	0.010
1445	12234	pentadecadienol	0.151
1451	5168	heptadecatriene	0.064
1463	770	heptadecatriene	0.009
1467	1248	heptadecatriene	0.015
1481	1416	2-pentadecanone	0.017
1499	968	caryophyllyl acetate	0.012

-continued

MS Spec #	Area Integration	Peak Assignment	Area %
1580	2392	? 250 m.w. w/115 base peak	0.029
1772	703	? long chain isoprenoid compound	0.009
1944–1995	337102	mix of hop acid analogues (lupulon, humulon + dihydro derivatives)	
	8124778	Total Essential Oil Components (minus hop acids)	100.000

I claim:

1. A new variety of hop plant, substantially as herein shown and described.

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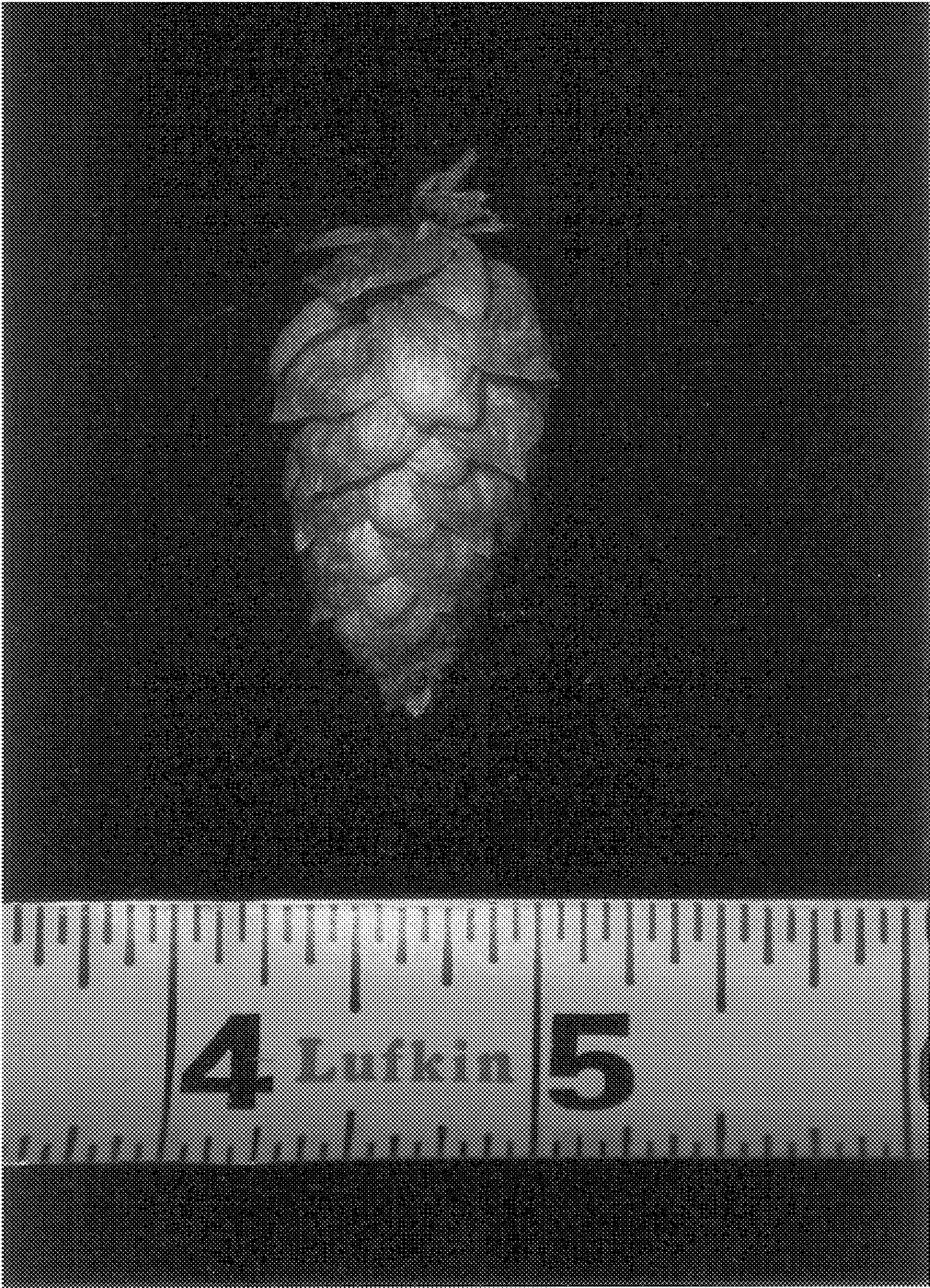


FIG. 1



FIG. 2

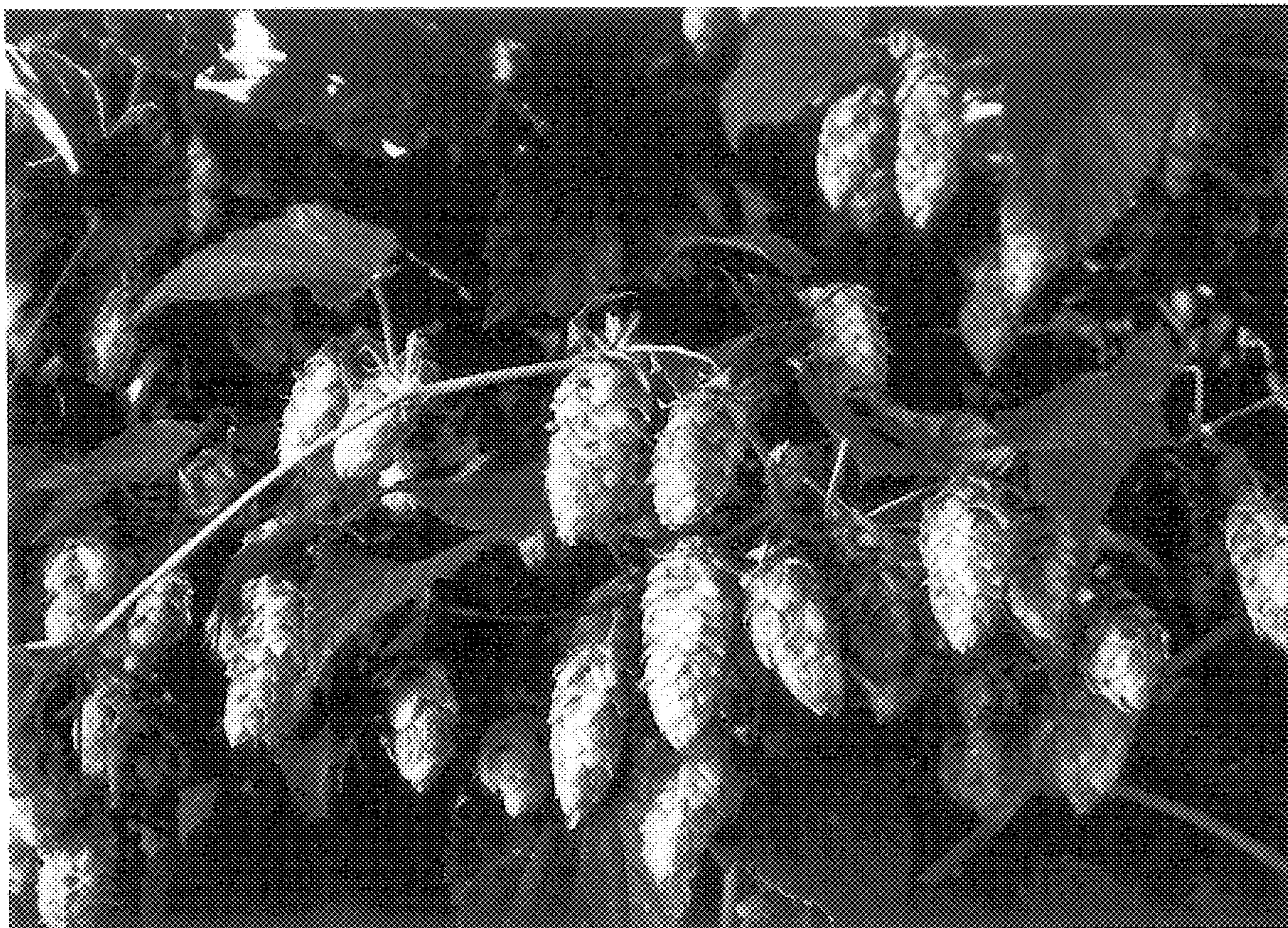


FIG. 3



FIG. 4



FIG. 5



FIG. 6