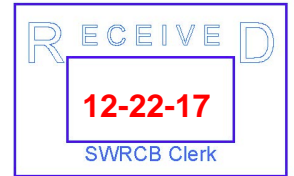


From: Ruth M Dahlquist-Willard
To: [commentletters](#)
Cc: [Aparna Gazula](#)
Subject: Comments to A-2239(a)-(c)
Date: Friday, December 22, 2017 10:37:18 AM
Attachments: [Comments on proposed order UCCE Small Farms.pdf](#)



Dear Ms. Townsend and Members of the State Water Resources Control Board,

I am writing along with Aparna Gazula to advise the Board of the concerns we have regarding the experiences of small-scale, socially disadvantaged farmers with diversified farming operations in achieving compliance with reporting requirements for the Irrigated Lands Regulatory Program. As a potential solution, we are proposing simplified reporting requirements and an alternate option for self-certification for these types of farms.

Our comments are attached to this email. Thank you for your consideration of these issues. We appreciate the time that the State Water Resources Control Board has taken to meet with us and hear our concerns about this group of farmers and the challenges they face, and we hope that the Board will take action to address their needs in the language of the Order. Please feel free to contact either or both of us with any questions.

Best regards,

Ruth Dahlquist-Willard and Aparna Gazula
University of California Cooperative Extension Small Farms Advisors, Fresno/Tulare and Santa Clara/Santa Cruz/San Benito Counties

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Comments on the Eastern San Joaquin River Watershed Agricultural Order

Ruth Dahlquist-Willard and Aparna Gazula, University of California Cooperative Extension Small Farms Advisors

I. Identifying unique needs and challenges for diversified, socially disadvantaged farmers:

Small-scale farms with a high diversity of crops face particular challenges in complying with the Irrigated Lands Regulatory Program (ILRP). These challenges are especially difficult for socially disadvantaged, immigrant, and refugee farmers, who may speak only their native language or have limited English and educational backgrounds as well as cultural barriers to understanding regulatory requirements. This issue was recognized by the Agricultural Expert Panel (Burt et al., 2014), whose report stated in section 4.3.3 (Farmer Involvement, p. 33) that:

“The Panel recognizes that there will likely be challenges in getting widespread compliance from growers with small farms. There is likely a need for special training, funding, and/or reporting requirements for this group.”

There is currently no funding for the level of outreach and technical assistance required to assist small farms with ILRP reporting requirements, and appropriate reporting requirements have not yet been developed. While coalitions are currently required to provide assistance to their members, including bilingual outreach, they may not be equipped to develop culturally appropriate educational programs or to address the unique needs of socially disadvantaged farmers, especially in conjunction with the complexity of their farming operations. Also, farms with less than \$250,000 in annual sales represent only 37% of the acreage of California farmland, but 81% of the individual farming operations (California Agricultural Statistics Review, 2016). Compared to larger farming operations, small farms comprise a much larger number of people needing more specialized technical assistance, but a much smaller number of irrigated acres overall. Consequently, coalitions may have difficulty justifying extensive outreach efforts for small farms to their larger members whose membership fees provide a greater contribution to coalition operating costs.

The University of California Cooperative Extension (UCCE) small farms programs in Fresno County and Santa Clara County have been assisting small-scale Southeast Asian and Chinese farmers with enrollment as members in water quality coalitions and completing the farm evaluations and the nitrogen management plans¹. We agree with the Agricultural Expert Panel’s recognition of the need for special training and reporting requirements, as well as the need for funding for the higher level of technical assistance necessary for these farms to be in compliance with ILRP requirements. Based on our experiences, we have identified several difficulties in completion of ILRP required reporting for these farms that make compliance far more challenging than for farms with large monocultures. It is essential to address the inequality that is currently inherent in ILRP requirements, so that the law does not negatively impact the livelihoods of farmers who are immigrants, refugees, and/or ethnic minorities, and whose farms contribute to the food security of socially disadvantaged urban communities. We strongly recommend that these issues be addressed in the current proposed order, so that small-scale, diversified, and socially disadvantaged farmers can participate in protecting water quality in a way that engages them meaningfully, is feasible for them, and provides accurate information to water quality coalitions and water boards.

¹ Although we are university academics, any opinions or statements in this document we make as individuals and not as representatives of the University or any of its offices or units.

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Certification of the Nitrogen Management Plan. There are currently three options for certification: 1) self-certification; 2) certification by a consultant; and 3) certification with a UC or USDA-NRCS recommendation. Self-certification is difficult because farmers must pass a closed-book test that is only available in English and requires proficiency in math and chemistry. Due to language barriers and lack of technical skills, many immigrant growers will not be able to self-certify their plans. Paying a consultant is possible, but it places an additional financial burden on small, limited-resource farmers. Additionally, commercial consultants are unlikely to be familiar with the diversity of ethnic specialty crops grown on these farms or to be able to provide accurate recommendations for nitrogen use. The third option of a UC or NRCS recommendation is also difficult, because recommendations do not exist for the wide variety of Asian and other ethnic specialty vegetables, herbs, and tropical and subtropical fruits grown on these farms, either individually or for categories such as “mixed vegetables” or “truck crops”.

Reporting of Yield. Accurate reporting of yield from small-scale, diversified farms is much more difficult and complex than from a large farm with a single crop. Highly diversified Southeast Asian farms could have 50 to 80 crops rotated through several cropping seasons on 20-40 acres over a year, and these crops are sold to a variety of markets and used for home consumption by the farmer’s extended family. Units of yield differ by the crop and market. For example, one farm could sell boxes of eggplant to a packing house, bundles of sugar pea tips to a local grocery store, bunches of moringa at a farmers market, and pounds of green papaya to a restaurant, with extended family members also taking home a percentage of each crop. This makes estimation of annual yield for the whole farm extremely difficult. Another concern is that farmers may under-estimate overall yield, since not all crops are sold due to home consumption. This could result in reporting A/R ratios that are higher than the actual values.

Calculation of Nitrogen Uptake. Crop-specific coefficients to calculate nitrogen removal are not known for most of the culturally important crops grown by immigrant farmers. Also, a generic or average coefficient for truck crops or mixed vegetables is not available. Because each diverse farm has a different combination of crops, one average or generic value for mixed vegetables is unlikely to give accurate information on nitrogen removed. We believe it is important to communicate the importance of accurate reporting to all growers. Research-based information on nitrogen uptake for specialty vegetables and averages for diversified farms that can be weighted based on crop mixtures is needed before yield data can be converted into nitrogen removed with enough accuracy to be meaningful for reporting.

Cultural and Linguistic Barriers. A large investment of time for one-on-one assistance is needed for small-scale, immigrant growers to understand program requirements and complete the calculations for the nitrogen management plan and summary. Bilingual workshops can be helpful to give an overview of ILRP requirements, but many immigrant and refugee farmers have language and educational barriers to completing the required forms on their own. The proposed order would require coalitions to provide outreach in multiple languages. In regions such as Fresno County that contain multiple language groups (for example Spanish, Punjabi, Russian, Hmong, Mien, Lao, Cambodian, Thai, and Vietnamese), effective and personalized bilingual outreach and technical assistance may be beyond the scope of what coalitions can reasonably provide.

Another barrier can be fear and mistrust of regulatory agencies based on past experiences. Starting in 2004, Hmong farmers began receiving citations in the thousands of dollars from the California Division of Labor Standards Enforcement for not providing workers compensation to extended family members

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exchanging farm labor for produce (Sowerwine and Getz 2013, Sowerwine et al. 2015, Sustainable Economies Law Center). Because these and other immigrant farmers have difficulty trusting that regulatory enforcement will be equitable and fair, it is essential to communicate clear expectations to them that they can understand, have the ability to comply with, and that are connected to logical enforcement outcomes.

Costs of compliance for small-scale farms. The burden of reporting for small-scale, diversified, and socially disadvantaged farms is disproportionate to that of large farms, both in terms of time and financial cost. Costs for membership in coalitions and for testing well water are substantially higher for smaller farms than for larger farms. Currently, farmers in Santa Clara County are required to submit data from well water tests twice a year in 2017 and twice a year in 2019 to the regional water board. The samples must be collected and analyzed by the approved testing facilities as specified by the water board. Including labor costs for sample collection by the third party, water sampling costs around \$310 for the initial composite analysis and \$220 for subsequent nitrate analysis per well. These prices are applicable to farmers within the Central Coast Groundwater Coalition, and annual membership fees are \$350 for less than 700 acres (<http://www.centralcoastgc.org>). Most of the Asian growers in Santa Clara County farm on less than 10 acres and have just one well for irrigation water needs. On a per acre basis, compared to the larger growers the costs for monitoring groundwater quality are very high for these small-scale growers, where 82% of farmers have less than \$100,000 in farm sales.

The burden of reporting for ILRP compliance is also disproportionate for small-scale, socially disadvantaged farmers in terms of the low probability of nitrate contamination from these small, limited-resource farms. In 2016, UCCE assisted 28 Chinese farmers growing Asian leafy vegetables in Santa Clara County with the ILRP nitrogen management plan and summary for their 2015 applications of fertilizer. These farms ranged from two to eight acres, with an average farm size of 4.31 acres. Amounts of nitrogen applied on average were very low compared to commercial recommendations for similar crops (Table 1). While no data are currently available on recommended rates of nitrogen application for these crops, one local certified crop advisor recommends 240 lbs/acre for bok choy. The most similar crops for which recommendations are available would be lettuce, broccoli and celery; however, these numbers are unlikely to provide accurate recommendations for Asian leafy vegetables due to differences in number of days to harvest, number of repeated harvests over a season, different parts of the plant as the harvested product (for example, shoots and leaves of gai lan and yu choy versus traditional broccoli heads) and differences in nitrogen uptake among crop species. We do not recommend that the California Fertilization Guidelines for lettuce, broccoli, and celery be used to substitute for the crops listed below. Still, using these numbers for general comparison shows that nitrogen applied for small-scale Asian leafy vegetable production in Santa Clara County seems to be far lower than what might be recommended commercially. Similar data are not available for Southeast Asian farms in Fresno County; however, anecdotal observation by UCCE staff over the last twenty years indicated that nitrogen use in these farms is similarly also low due to limited financial resources to purchase farm inputs and levels of nitrogen available in the soil and irrigation water.

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Table 1. Nitrogen application reported by Chinese-American farmers for Asian leafy vegetables in Santa Clara County in 2015.

Crop	Average N applied (lb/acre)	Range of N applied (lb/acre)	Estimate of recommended N application (lb/acre)
Bok Choy	58.7	12 – 139	240 ^a
A Choy (Taiwanese lettuce)	59.5	26 – 139	120 – 220 ^b
Gai Choy (mustard greens)	54.7	7 – 139	?
Yu Choy	22.9	7 – 71.1	170 – 270 ^c
Gai Lan	55.2	7 – 213	170 – 270 ^c
Chinese Celery	108.6	51 – 253	200 – 290 ^d
Amaranth	55.2	18 – 142 (multiple harvests) ^e	?
Malabar Spinach	52.9	26 – 250 (multiple harvests) ^e	?
Yam Leaves	133.4	7 – 188 (multiple harvests) ^e	?
Edible Chrysanthemum	63.1	7 – 213 (multiple harvests) ^e	?
On Choy (water spinach)	155.4	46 – 379 (multiple harvests) ^e	?
Garlic Chives	140.9	18 – 500 (multiple harvests) ^e	?

^aSource: Information from certified crop advisor in Salinas County.

^bSource: California Fertilization Guidelines for lettuce. Includes preplant and in-season applications.

^cSource: California Fertilization Guidelines for broccoli. Includes preplant and in-season applications.

^dSource: California Fertilization Guidelines for celery. Includes preplant and in-season applications.

^eNitrogen applied corresponds to multiple, ongoing harvests of leaves from the same plant over a season.

Lack of funding for outreach, education, and technical assistance. It is common practice for new regulatory programs to be accompanied by funding for education and outreach. For example, the FDA’s Food Safety Modernization Act (FSMA) became law in 2015, and millions of dollars of federal and state funding have been available for nonprofit groups, universities, and other organizations to conduct food safety education. FSMA also presents large challenges for small-scale and diversified farms. However, these problems are being addressed through the funding for outreach and technical assistance as well as a partial exemption for farms with annual sales under \$500,000 and with a majority of produce sold through direct marketing. The ILRP currently has no exemption or alternative requirements for small farms. Other than coalition membership fees, little to no funding is available for specialized outreach and technical assistance for farmers who have language and cultural barriers to understanding reporting requirements, and/or complex farming systems for which reporting is more difficult than for large monoculture farms. These farms need much greater assistance than what the coalitions can provide.

Proposal for an alternate self-certification for Irrigated Lands Regulatory Program reporting

Alternate self-certification option for diversified, socially disadvantaged farmers. The complexity of cropping systems combined with the challenges of cross-cultural communication make accurate and meaningful reporting difficult for the farms described above. These challenges also exist for other regulatory programs, including the Food Safety Modernization Act (FSMA) and the soon to be implemented Sustainable Groundwater Management Act (SGMA). The financial and labor costs for compliance with multiple regulatory programs are substantial for small-scale farms, and additional support and educational efforts are needed for these farms to continue to be economically viable. In order to address the challenges listed above, we propose an additional option for self-certification of nitrogen management plans, accompanied by simplified reporting on the INMP form and N summary.

Farmers could indicate that they qualify for the alternate self-certification by checking a box for “diversified, socially disadvantaged farmer” on the membership registration form for their water quality coalition. Qualification for this category could be verified with site inspection if needed, or by the farmer submitting documents such as their list of crops registered for sale at farmers markets. The alternate self-certification could use one of the existing lines on the nitrogen management plan (either self-certification or UC/NRCS recommendation), or another line could be added.

Definition of farmers who qualify. We suggest the following characteristics for farms that could qualify for the alternate self-certification:

1. Farm size of less than 45 irrigated acres. The median farm size of Asian minority farmers in Santa Clara County is 4 acres. Farm size ranges from 0.25 acre to 60 acres, with 72% of farms under 5 acres in size. A survey of 83 Southeast Asian farmers in Fresno and Sacramento Counties in 2013 found that the median farm size was 8.8 acres, with a range of 0.5 to 60 acres (Sowerwine and Getz 2013). Nearly half of the farms surveyed were five acres or less, and only one farmer reported 60 acres. In Fresno County, previous surveys had found an average farm size of 5.8 acres for Hmong farms and 7.8 acres for Lao farms in 2007, which had both increased from averages of 3.25 acres for Hmong farms and 5 acres for Lao farms in 1992 (Molinar et al. 2007). In a 2015 survey of 48 Hmong farmers, the average farm size was 11.34 acres with a range from 1 acre to 60 acres, and 96% of farms were under 50 acres (Dahlquist-Willard et al. unpublished data).

It is common practice for Southeast Asian farmers to subdivide parcels of land among several farmers, who are often relatives. This applies both to Southeast Asian landowners who grant leases of partial acreage on their property to several farmers, and to Southeast Asian tenant farmers who lease a parcel in their own name and sublease sections of it to several additional farmers. In the 2015 survey, 80% of farmers were farming on rented land (average farm size of 7.42 acres), and 20% owned their farms (average farm size of 17.78 acres) (Dahlquist-Willard et al. unpublished data). Farms in the 30-40 acre range are more likely to be subdivided among several farmers, and reporting to the coalition is done on the basis of the APN of the parcel by one farmer.

In both Fresno County and Santa Clara County, the size of a small-scale, diversified, Asian immigrant farm can be up to 60 acres. We recommend a maximum of at least 45 acres for the upper limit of this category to include larger parcels that are subdivided among several farmers, as well as farms that are

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on the higher end of the size range for these small farms but have the same needs for bilingual training and difficulties in reporting from diversified crops.

2. Farm income of less than \$350,000 gross annual sales. This is based on the USDA definition of a small farm for the 2012 Census of Agriculture (USDA-NASS, 2015).

3. Crop diversity greater than or equal to 0.5 crops per acre (one crop for every two acres), or 30 acres or less of a specialty crop for which the coefficient to determine nitrogen removal is not known. This recommendation on crop diversity is based on patterns observed in Southeast Asian farms in Fresno County. Crop diversity would be calculated by dividing the total number of crops by the total irrigated area of the farm. We also recommend that socially disadvantaged farmers with small acreage (up to 30 acres) of specialty crops that lack a coefficient to determine nitrogen removed from the farm be included in this category, as they will have similar needs for training and similar difficulties in reporting.

4. Socially disadvantaged farmer as defined by the Farmer Equity Act. The Farmer Equity Act (AB 1348) requires the California Department of Food and Agriculture to ensure the inclusion of socially disadvantaged farmers and ranchers in the development, adoption, implementation, and enforcement of food and agriculture laws, regulations, and policies and programs. The Act defines socially disadvantaged farmers as being part of “a group whose members have been subjected to racial, ethnic, or gender prejudice because of their identity as members of a group without regard to their individual qualities”, including African Americans, Native Indians, Alaskan Natives, Hispanics, Asian Americans, Native Hawaiians and Pacific Islanders, and members of urbanized areas (50,000 people or more).

Number of farmers and acreage estimated for this category. We believe these recommendations would define a relatively narrow category of growers who are most in need of bilingual and culturally appropriate training and simplified reporting requirements. Table 2 shows a total of 9,429 Asian and Hispanic or Latino operated farms with less than \$250,000 gross annual sales in 17 selected counties. Many of these farms would fall into the category defined above, depending on the diversity of their crops. While data are not readily available on the acreage of these farms, USDA census reports include graphs showing the number of farms by size for each ethnic group (Table 3). There is a clear pattern in which the majority of Asian and Hispanic or Latino operated farms are less than 50 acres. These farms likely represent a small amount of California’s irrigated acres of farmland, but a large number of individuals needing training to complete reporting requirements.

Appendix 2 contains additional information on Asian farms in Fresno and Santa Clara Counties relevant to the above characteristics. This category could also be expanded, for example to include farms 60 acres or less, or to include socially disadvantaged farmers who have only one or a few crops, but still need more intensive technical assistance. One option could be to require a subset of these characteristics (for example, three out of the four above requirements). If all four of the above characteristics are required, the alternate self-certification option would not be available for socially disadvantaged farmers with small-scale farms having only one crop (for example, peri-urban Southeast Asian farmers specializing in only strawberries or Latino farmers with small acreage of one or a few vegetable crops). While these farms would have simpler calculations due to having only one crop, they would still have substantial cultural and language barriers and need more one-on-one assistance with the reporting requirements.

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Table 2. Numbers of small farms with less than \$250,000 in gross annual sales and Asian and Hispanic or Latino operators in selected counties.

County	Asian farms < \$250,00	Hispanic/Latino farms < \$250,000	Total Asian + Hispanic/Latino farms < \$250,000
Fresno	792	986	1778
Tulare	265	1093	1358
San Diego	319	888	1207
Riverside	236	581	817
Stanislaus	79	506	585
San Joaquin	175	393	568
Merced	165	314	479
Ventura	110	321	431
San Luis Obispo	75	326	401
Sacramento	178	132	310
Santa Barbara	60	238	298
Madera	100	191	291
Kern	53	179	232
Santa Clara	101	101	202
Monterey	32	155	187
Kings	34	142	176
Santa Cruz	37	72	109
Totals	2811	6618	9429

Source: 2012 Census of Agriculture, USDA-NASS.

Mandatory Annual Training. The proposed alternate self-certification would require attendance at an annual training event. The training would be a minimum of four hours long and modeled after the existing grower certification training, but adapted to be hands-on and culturally relevant to the farmers attending. It would include training on best management practices for irrigation and nutrient management, with a focus on farms with mixed vegetables and specialty ethnic crops. Training would be coordinated by local water quality coalitions and UCCE, with other potential partners such as USDA-NRCS, Resource Conservation Districts, or industry representatives. It may be possible to coordinate trainings regionally, so that farmers have more than one option if they cannot make one of the trainings. Coalitions could provide financial support for components such as translation services, printing materials, or other related expenses. Data on farmer attendance would be reported to the appropriate coalition. Evaluations would also be conducted to assess the effectiveness of the training and track changes in knowledge and management practices over time.

Simplified Reporting of Nitrogen Applied. The goal of the simplified reporting is to assist farmers in learning how to calculate total nitrogen applied as a first step in compliance with ILRP reporting requirements, and to gather data that would be useful in understanding the relationship between nitrogen applied, acreage, and typical crop mixtures. Farmers would be required to complete all sections

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of the Irrigation Nitrogen Management Plan (INMP) and INMP Summary Report, except for the following:

- Crop production units
- Crop evapotranspiration
- Projected yield
- Primary and secondary crop harvest yield
- Yield on INMP Summary Report

These sections are excluded based on the difficulty of calculating yield from highly diversified farms, and the technical difficulty in calculating crop evapotranspiration for this group of farmers. Reporting applied nitrogen alone would require substantial one-on-one technical assistance, particularly for the calculations of nitrogen present in different types of fertilizers and converting nitrogen in soil and irrigation water to the appropriate units to use in calculating total nitrogen applied. To substitute for these sections, farmers would be required to report the following additional information:

- Number of rotations per year
- Number of crops per year
- Summary of crops most representative of the diversified farm (based on highest acreage and/or most frequently rotated)

These data would allow identification of outliers based on nitrogen applied per acre for small-scale diversified farms. Data reported on nitrogen applied, acreage, and crop mixtures could be used to better understand typical nitrogen application practices and to generate recommendations for future reporting requirements.

Periodic Evaluation. The alternate self-certification option would be approved for a period of five years, with a re-evaluation and option to extend and modify the alternate requirements every five years. This could coincide with evaluation of data reported on the Farm Evaluations every five years. Evaluation data collected during the trainings would also be included. Extension and modification of the alternate certification option could be based on feedback from UC Cooperative Extension and other groups providing training, as well as data collected from training evaluations and reporting of management practices and applied nitrogen. Evaluations of the alternate self-certification option could also provide feedback on progress being made towards reporting of yield from diversified farms, as well as specialty vegetables and other culturally important crops, and could recommend a timeline for incorporating yield into the required reporting. This could take into account any new information on nitrogen removal coefficients or methods for estimating yield for diversified farms that may be developed over time with further research.

Reduced Frequency of Sampling. The higher costs for small-scale farms in proportion to income and acreage could be addressed by reducing the required frequency of well testing for farms below a specified income level. We do not have specific recommendations for individual water quality coalitions, but recommend language in addition to that currently in the proposed order to require coalitions to adjust the frequency of sampling to be proportional to farm income.

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Appendix 1: Characteristics of small-scale, diversified, and socially disadvantaged farms

Below we present characteristics of small-scale, diversified, and socially disadvantaged farms that are relevant to the challenges they face with regulatory compliance. This information is based on our experience working with Southeast Asian and Chinese growers in Fresno and Santa Clara Counties, and illustrates broader issues that are applicable for diversified farms and socially disadvantaged farmers throughout the state: for example, diversified Latino and African-American farms selling traditional ethnic crops at farmers markets, and diversified urban farms.

A. Southeast Asian farms in Fresno and the wider Central Valley

Demographics. The USDA National Agricultural Statistics Service reported 919 farms with Asian operators in Fresno County in 2007, and 1,036 farms in 2012. However, the number of Southeast Asian farmers is greater than the national census numbers due to low participation in mail-in surveys. A comprehensive survey conducted by Richard Molinar and Michael Yang in 2007 found over 1300 Southeast Asian farmers in Fresno County (Molinar et al. 2007). Approximately 900 of these were Hmong, with around 400 Lao and smaller numbers of Mien, Cambodian, Chinese, Vietnamese, and Thai farmers. While most of the statistics available on Southeast Asian farms are from Fresno County, there are similar farms in many areas of the larger Central Valley, especially around Visalia, Merced, Stockton, and Sacramento. These include small-scale diversified vegetable farms and strawberry farms with roadside stands. In the 2012 census, 792 of the 1036 Asian farms in Fresno County (76.4%) had \$250,000 or less in gross annual sales.

Crop Diversity. Southeast Asian farms typically are highly diversified and cultivate a large variety of specialty vegetables, herbs, and tropical and subtropical fruits (Table 3) for a variety of different markets as well as home consumption by family members. Many of these crops are classified as “oriental vegetables” in county and state crop reports, and they can include traditional crops for Filipino, Indian, Latino, and other ethnic specialty markets. They are sold to farmers markets, roadside stands, ethnic grocery stores, restaurants, and wholesale packing houses that ship to markets for Asian immigrant communities across the country. In addition to specialty crops for ethnic markets, these farms can also include crops for mainstream customers such as broccoli, cauliflower, Swiss chard, bell peppers, parsley, cilantro, lettuce, spinach, Italian eggplant, cabbage, cucumber, and others. Many farms also include a patch of strawberries. Mien farmers in particular have specialized in strawberries, and many have strawberry stands for urban consumers in Visalia, Fresno, Sacramento, Stockton, and Merced. Because crops are rotated through 3-4 cropping seasons annually, especially for year-round farmers market sales, these diversified farms can produce 50-80 different crops over a year.

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Table 3. Specialty ethnic vegetables commonly grown on Southeast Asian farms (not all-inclusive).

Squashes	Luffa gourd, Winter melon, Bittermelon, Wax gourd, Hairy melon, Bottle gourd, Snake gourd, Hmong pumpkin, Kabocha squash, Hmong cucumber, Chayote, Korean melon, Ivy gourd
Brassicas	Bok choy, Yu choy, Gai lan, Chinese (Napa) cabbage, Mustard greens, Tat soi, Daikon, Lo bok, Thai broccoli, Kale
Legumes	Chinese long bean (asparagus or yardlong bean), Edible pod peas (snow, snap, and sugar), Sugar pea tips, Peanuts, Lablab (hyacinth) bean, Pigeon pea, Guar bean, Faba bean
Nightshades	Eggplant (Chinese, Japanese, Thai, and Indian), bunching eggplant, Hmong bitter eggplant, Thai chili pepper, Cherry tomatoes, Black nightshade
Root crops	Taro root, Japanese yam, Sweet potato, Jicama, Jerusalem artichoke, Burdock, Mountain potato (yama imo)
Monocots	Sugarcane, Lemongrass, Japanese bunching onions (multiplier onions), Water chestnut, Hmong sticky corn
Fruits	Guava, Passionfruit, Papaya, Jujube, Prickly pear cactus, Strawberries
Greens	Malabar (Ceylon) spinach, Water spinach (ong choy), Okra leaf, Cassava leaf, Yam leaf, Amaranth, Moringa, Celtuce, Chayote tips, Pumpkin tips, Pumpkin flowers, Watercress
Herbs	Ginger, Sour leaf, Chrysanthemum leaves (tong ho), Turmeric, Tears of the virgin, Jewels of Opar, Sichuan pepper, Basil (holy basil, lemon basil, Thai basil), Fenugreek, Mint, Vietnamese mint, Lime leaf, Culantro, Cilantro, Dill

A video from the University of Hawaii Cooperative Extension showing some of these crops is available at:

<https://www.youtube.com/watch?v=gDQqSvwEXZg&feature=youtu.be>

Markets and Income. Southeast Asian farms vary in size and marketing strategies. A survey of 83 Southeast Asian farmers in 2013 found that the median farm size was 8.8 acres, with a range of 0.5 to 60 acres (Sowerwine and Getz 2013). Nearly half of the farms surveyed were five acres or less, and only one farmer reported 60 acres. Previous surveys had found an average farm size of 5.8 acres for Hmong farms and 7.8 acres for Lao farms in 2007, which had both increased from averages of 3.25 acres for Hmong farms and 5 acres for Lao farms in 1992 (Molinar et al. 2007). Smaller farms (0.5 - 10 acres) tend to focus more on home consumption and local direct sales to grocery stores or restaurants, while larger farms (10 - 40 acres) may have more sales to farmers markets and wholesale buyers. One previous survey estimated that the majority of these farms had annual gross revenues between \$5,000 and \$50,000 (Sowerwine and Getz 2013). While these estimates may seem low, they probably reflect the large number of farms that are smaller in size and the common practice of providing fresh produce to the farmer's household and extended family members for home consumption and use in traditional herbal medicine.

Land Tenure. Many Southeast Asian farmers are tenants on rented land, often in peri-urban areas. In a 2015 survey of 48 Hmong farmers, 80% were farming on rented land (average farm size of 7.42 acres), and 20% owned their farms (average farm size of 17.78 acres) (Dahlquist-Willard et al. unpublished data). Relationships between tenant farmers and landowners can vary widely. Landowners who live in the area may be more involved with the farming operation, while those who live farther away may contact the farmer only once or twice per year. Some Hmong landowners subdivide their 30-40 acre parcels for leases to 5-6 different farmers and maintain close communication with their tenants.

Fertilization Practices. Fertilizers commonly applied include triple-15, UN-32, or CAN-17. Application of micronutrients is less common, and there is a need for education on micronutrient deficiencies and appropriate application. Very few Southeast Asian farms use compost or manure, although they

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frequently till the residue of harvested crops into the soil as part of their crop rotations through different sections of a field.

B. Chinese farmers in Santa Clara County

Demographics. The median farm size of Asian minority farmers in Santa Clara County is 4 acres. Farm size ranges from 0.25 acre to 60 acres, with 72% of farms under 5 acres in size. There are 280 Asian farmers in Santa Clara County, a large majority of whom are Cantonese speaking Chinese immigrants. According to the 2012 USDA Agricultural census, of the 205 Asian farms that reported the information, 82% of the Asian farms (168) had farm sales less than \$100,000 per year and 67% (137 farms) had farm sales less than \$50,000 per year. Based on farmer interviews, the major farming challenges they face are: 1) competition from Mexico that drives low product prices; 2) cultural and language barriers to complying with county, region, state, and federal regulations; and 3) lack of access to farm labor and challenges with providing adequate farm worker housing.

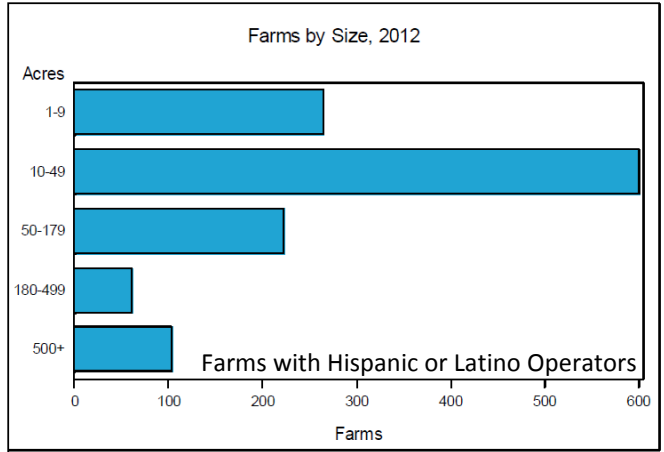
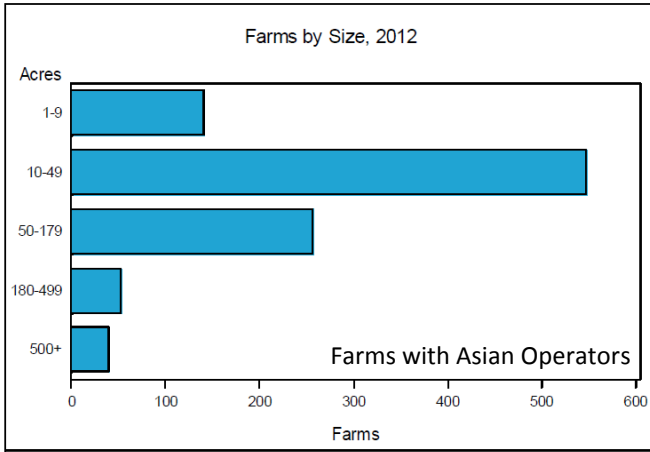
Crop Diversity. Asian farmers in Santa Clara county primarily grow Asian vegetables and herbs such as Bok choy, A choy, edible amaranth, Chinese celery, Chinese spinach, garlic chives, daikon radish, Gai choy, Gai lan, green garlic, Malabar spinach, On choy, Shanghai Bok choy, snow pea tips, Tong ho, yam leaves, and Yu choy. These vegetables are grown in multiple rotations per year under protected structures. Many of these crops are harvested once while others such as garlic chives, Tong ho, edible amaranth, and yam leaves are harvested multiple times. These crops are marketed primarily through wholesale channels.

Fertilization Practices. Fertilizers commonly applied include triple-15, triple-9, triple-20, ammonium sulfate, urea, Neptune Harvest Fish Fertilizer (2-4-1), CAN-17. Application of micronutrients is less common. None of the Chinese farmers in Santa Clara County use compost or manure, however all the farmers till the residue of harvested crops into the soil as part of their crop rotations through different sections of a field.

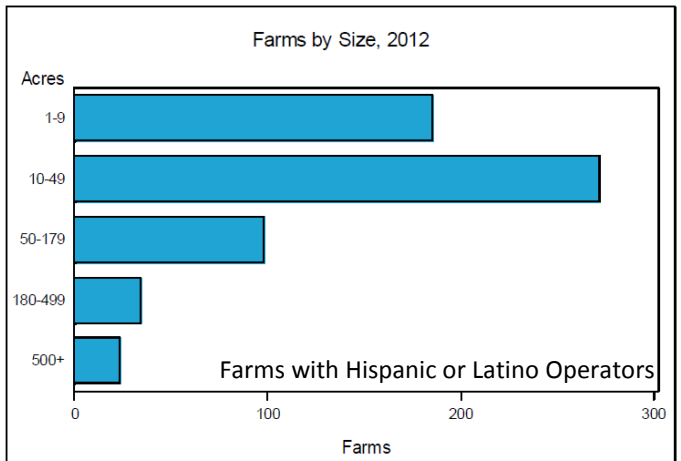
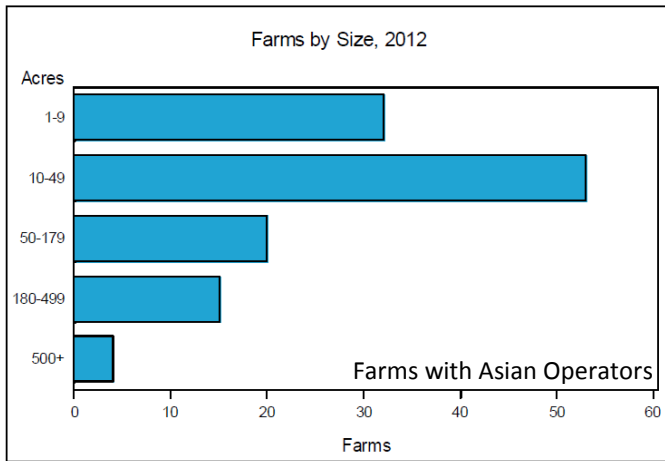
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Appendix 2: Farms by Size and Ethnicity for Selected Counties
 Source: USDA-NASS 2012 Census of Agriculture

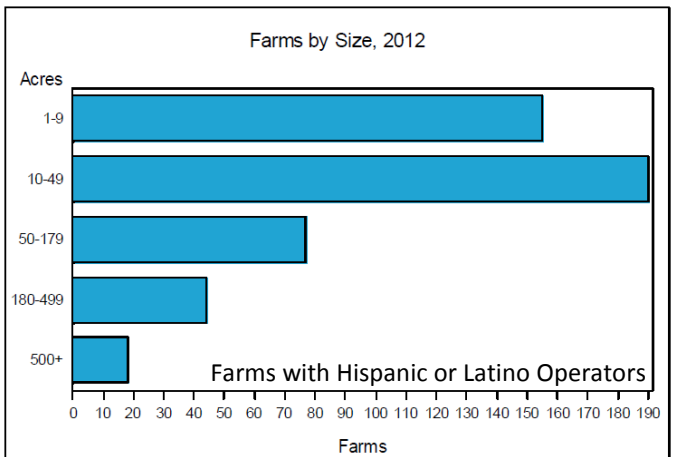
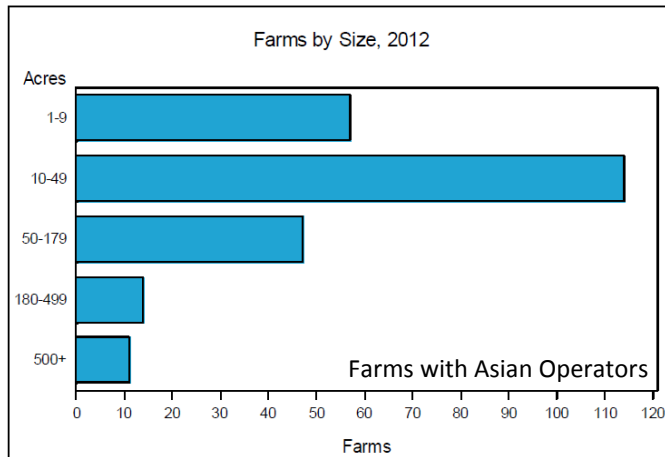
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Stanislaus County:

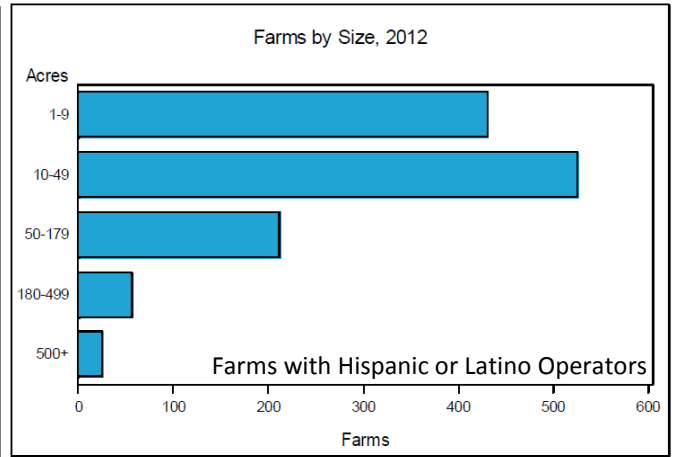
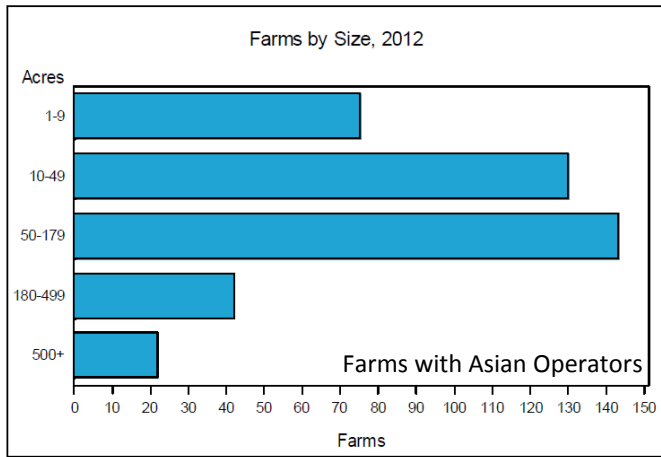


San Joaquin County:

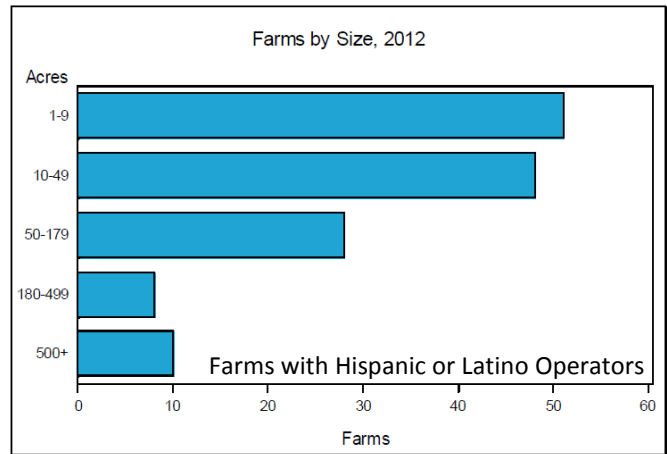
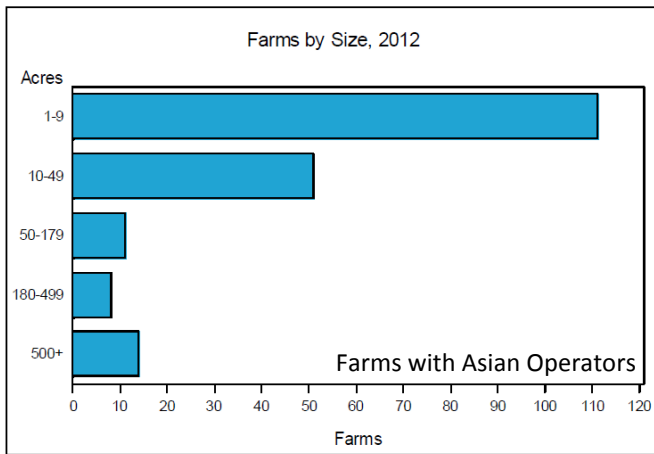


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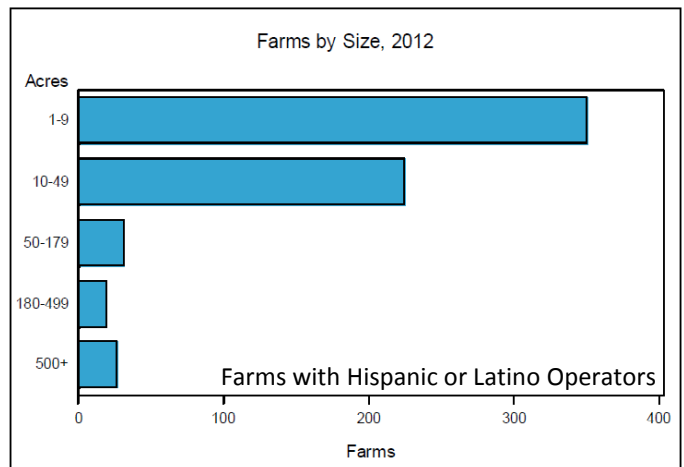
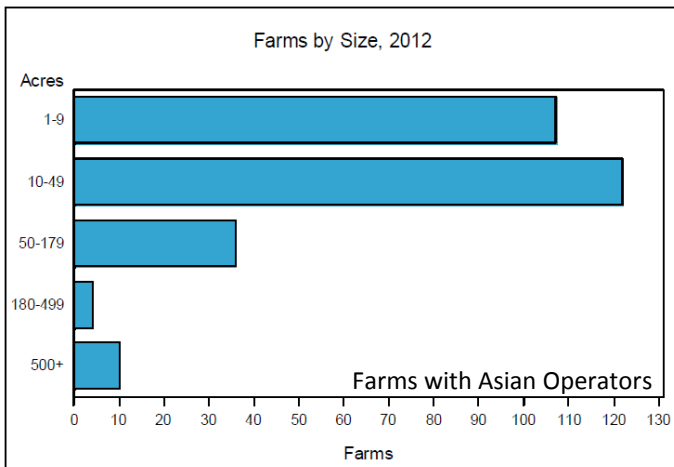
Tulare County:



Sacramento County:

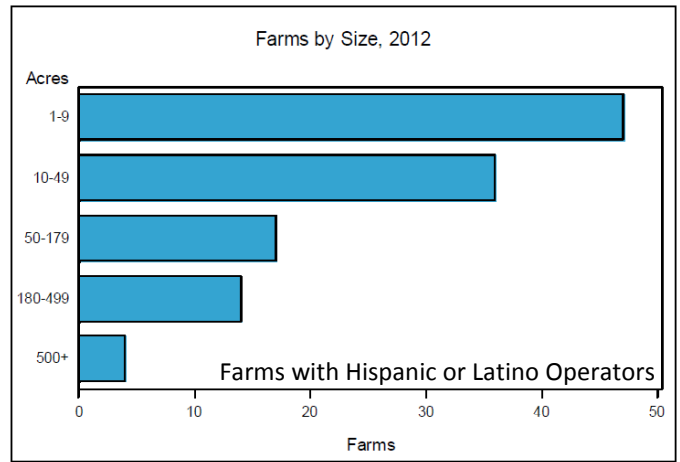
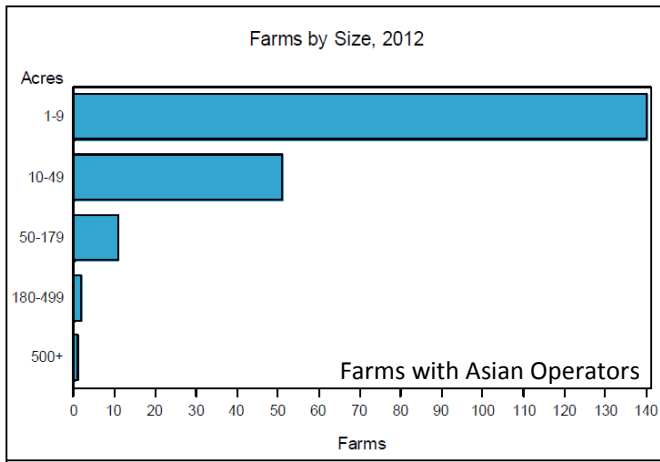


Riverside County:

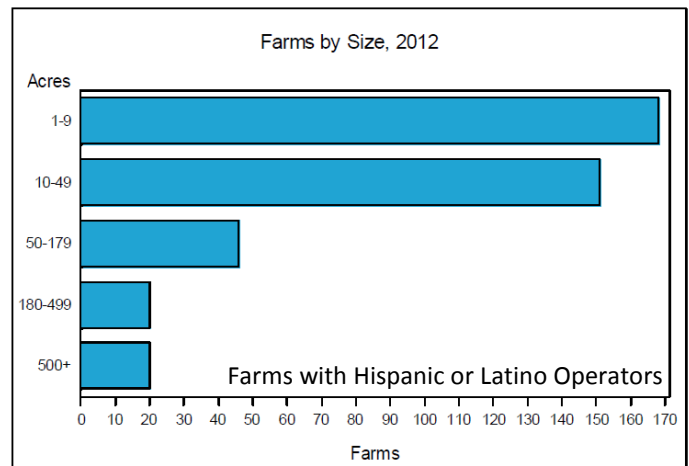
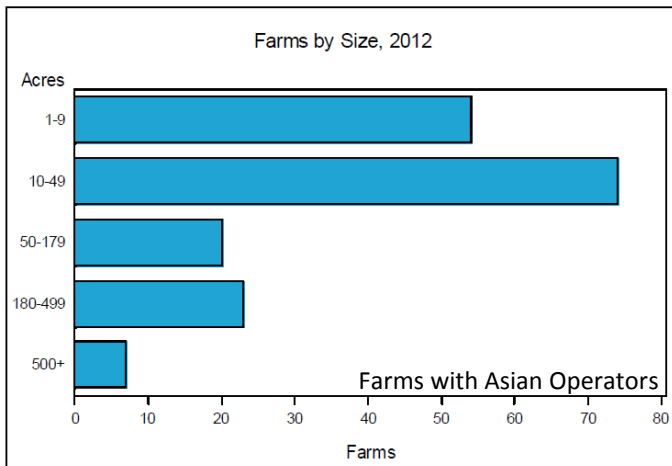


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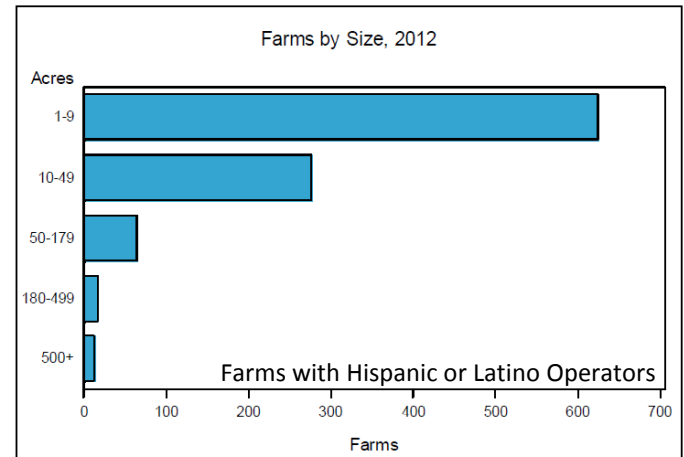
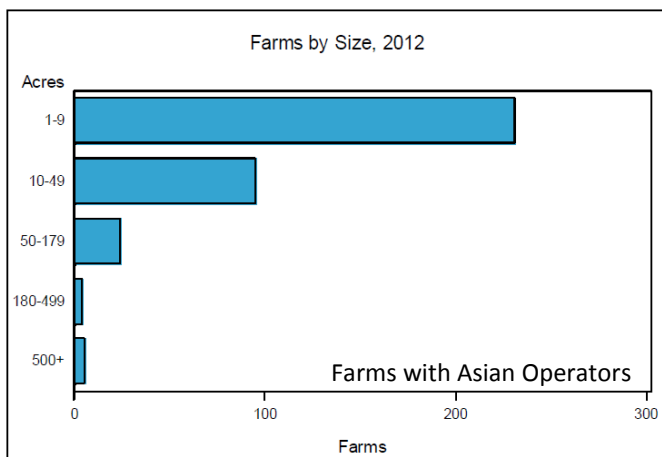
Santa Clara County:



Ventura County:



San Diego County:



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