



Foundation Plant Services

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UCDAVIS

FPS DNA-BASED WALNUT VARIETAL IDENTIFICATION AND PROFILING SERVICES

FPS now offers DNA-based walnut varietal identification and profiling services on a fee-for-service basis. This service offers to nursery managers, growers, breeders and other industry representatives the technology to determine or confirm the varietal identity of walnut trees or to characterize the unique "fingerprint" of new cultivars developed by private and public breeding programs. The new walnut varietal identification service utilizes a new system and a new database developed in the laboratory of the USDA-ARS National Clonal Germplasm Repository at Davis in collaboration with researchers in the UC Davis Pomology Department. The database contains profiles for all major walnut cultivars grown in California. Genetic profiles (DNA fingerprints) of client samples are generated and compared to the known profiles in the database. Both domestic clients and clients from outside the U.S. may submit samples for analysis.

SERVICE DESCRIPTIONS

Service 1: Genetic (DNA) identification of walnut cultivars

Used to determine or confirm the identity of a particular walnut sample. For this purpose, DNA extracted from a leaf sample of a tree in question is typed at 12 microsatellite markers. The resulting DNA profile is compared with the database of profiles of known varieties. Statistical analysis suggests that these 12 markers are sufficient to uniquely identify all walnut cultivars to an extremely high degree of confidence.

Service 2: Genetic (DNA) profiling of new walnut cultivars

Used to create a unique characterization (DNA fingerprint) of a walnut cultivar for patenting and varietal protection. For this purpose, two separate samples of the new cultivar as well as two samples of each parent are typed at 12 microsatellite markers. Inclusion of parent profiles in the analysis enables technical staff to observe the markers being inherited and is useful in cultivar patent protection. The process is completed twice for each cultivar.

4/1/04

PRICES

Service 1: Genetic (DNA) identification of walnut cultivars (results in 8-10 weeks)

1-5 samples per lot \$400.00 per sample
6 or more samples per lot..... \$300.00 per sample

Service 2: Genetic (DNA) profiling of new walnut cultivars

DNA profiling \$2,500.00 per cultivar

An invoice for testing services will be sent to you along with your results when testing is complete. Payment is due upon receipt of invoice.

AGREEMENT FOR PROVISION OF DNA-BASED IDENTIFICATION SERVICES

To initiate DNA-based walnut varietal identification and/or profiling services, please complete and sign both of the attached copies of the "Agreement For Provision Of DNA-based Plant Varietal Identification and Profiling Services", being sure to specify in Attachment A which service(s) you are requesting and identify the name and number of the samples you are submitting. Both of the completed and signed originals of the Agreement and Attachment A must be submitted to FPS along with your samples. After the Agreement is signed on behalf of the University in the UCD Business Contracts Office, you will receive a fully-executed original in the mail for your records.

SAMPLE COLLECTION AND SUBMISSION

The best samples are young, actively-growing leaves that are not yet fully expanded. Older leaves may also be submitted. Leaf samples are dried down chemically to preserve the DNA and ensure the stability of the sample. Drying also eliminates the need to keep the samples chilled and moist and, since the samples are dried, dead tissue, they are not subject to quarantine regulations governing the importation of living tissue. Materials and instructions for collecting and drying the leaves will be provided as part of the service. Prior to submitting samples, please contact testing service manager Jerry Dangl (phone 530-752-7540; email address gsdangl@ucdavis.edu). Ship samples to one of the following addresses, depending on method of shipment:

UPS, FedEx, DHL, other courier:

Foundation Plant Services
Attn: Jerry Dangl
University of California
S.W. Corner Hopkins & Straloch Rds.
Davis, CA 95616 U.S.A.

U.S. Mail:

Foundation Plant Services
Attn: Jerry Dangl
University of California
One Shields Ave.
Davis, CA 95616-8600 U.S.A.

All samples will be inspected and properly labeled and stored upon receipt. Any samples received in poor condition (see guidelines above) will not be tested. Customers will be notified of any samples received in unsatisfactory condition, and arrangements can be made to have replacement samples delivered for testing. DNA testing will be done in the time frame agreed upon in the contract for service. All testing will be completed by qualified technicians, and results will be reviewed by the testing service manager prior to being reported to the customer. The customer will receive a written report of all results.

DISCLAIMER

Although DNA profiling is a very powerful and sensitive identification tool, it has its limitations:

1) Although the university's reference database contains all important walnut cultivars grown in California, it does not contain all cultivars. If there is no reference profile for the cultivar of the submitted sample, then the university cannot identify the sample. User will pay for work performed by the university regardless of whether or not sample can be identified.

2) The technology used for the university's standard service cannot distinguish variants within a cultivar. Profiles for such variants, referred to in the industry as "somatic mutants" or "bud-sports", will be identical, though the difference in the appearance of the plant and/or the nut may be significant.

3) Numerical designations used to define microsatellite allele sizes may differ slightly between laboratories due to differences in methodology. Adjustments for inter-laboratory differences can be made by referencing common cultivars that have the same alleles as the samples being analyzed.

4) Ambiguous genotypes at individual markers are occasionally observed. These ambiguities, a normal consequence of the methodology, can be resolved if the parents of the cultivar are also analyzed. Such ambiguities do not normally pose a problem in creating a profile unique to the tested cultivar, as the results for the other markers are usually unambiguous, and these alone can be expected to characterize the cultivar uniquely.

WHO TO CONTACT FOR MORE INFORMATION

If you have questions about this service or would like more information about DNA-based walnut identification services, please direct your inquiries to the service manager:

Jerry Dangl, Staff Research Associate

Phone: (530) 752-7540 Email: gsdangl@ucdavis.edu