B. Management Plan

SolCAP has an overall PD (Douches) with a project assistant, an Executive Committee (EC, consisting of co-PDs), and team leaders for each objective (See Fig. 1). It was determined at the first SolCAP meeting (January 2009) that we would have one Advisory Board composed of 11 scientists and industry leaders (*see letters of intent*) that can review the breath of SolCAP and provide advice, oversight. The scientists are: *G. Bryan* (Scottish Crops Research Institute) with expertise in genomics and mapping QTL in potato; *D. Zamir* (Hebrew University, Jerusalem), a leader in tomato translational genomics and coordinator of the germplasm module for EUSol; *D. Neale* (UCD), an expert in association mapping and Project Director of the Conifer Translational Genomics Network; and *J. Giovanonni* (CU), PI of the U.S. tomato sequencing efforts with expertise in high throughput genomics in tomato. The stakeholders are composed of five industry leaders in the vegetable industry: *R. Hoopes*, potato breeder with Frito-Lay (largest chip-processing company); *C. Rommens*, research leader of Biotechnology group at Simplot (second largest frozen vegetable processing company); *T. Osborn*, research leader with Seminis (vegetable seed company); *E. Legg*, research leader for Syngenta Seeds; and *C. Rivara*, head of California Tomato Research Institute (a grower funded organization). The education/extension advisory members are *D. Namuth*, U. of Nebraska, with expertise in on-line extension in plant breeding and genetics, and *D. Lewis* (OSU), a leader of extension program development and evaluation.

This CAP encompasses two crops and associated breeding communities, all of which need to be in communication. There will be a clear need for commodity point persons. Douches and Francis are the leaders for the potato and tomato breeding communities, respectively. As "germplasm team leaders", they are, in consultation with community stakeholders, developing cooperator guides for phenotypic evaluation. Germplasm team leaders present SolCAP activities at national and regional meetings, encourage workshop attendance, and act as listeners and communicate community needs. As point people, they also are working with SGN to make sure the web and data interface design have breeder input, and also report activities to the EC monthly.

Douches, as PD (25% time), provides quarterly CAP updates to the SolCAP community through the newsletter, schedules monthly conference calls with the co-PIs regarding research and databases (SGN, phenotyping, genotyping, sequencing), eXtension.org and education (workshop development, graduate curriculum development), along with monthly conference calls with the EC to assess progress, and sets quarterly goals. Final decisions regarding small grants, project direction changes in research, education and education and budgets are made by Douches. Douches consults the Executive Committee for input on issues and then consults the appropriate advisory boards (stakeholder, scientific and education and extension) prior to final decisions. Ad hoc meetings are carried out via conference calls and email. Douches also provides reports to USDA/AFRI and ensures that all SolCAP participants will be kept in communication via email updates (newsletter) and the SolCAP website. The project assistant (Kelly Zarka) helps coordinate daily operations, collect and organize reports, create slides, posters and brochures that can be used by SolCAP scientists, schedules yearly workshop and conference calls, liaises with financial officers and maintains the website. Douches and Zarka will work with Dr. Coe on extension/education assessment. MSU provides the fiscal management and budget oversight.

The advisory boards will meet annually at the Plant and Animal Genome Conference in San Diego or other Solanaceae meetings. A workshop will take place where research will be presented by team leaders. SolCAP scientists will discuss projects and new developments. Following presentations, the boards, in concert with the PD and EC, will evaluate, quantify and assess progress, then re-direct effort and budget as needed. PD will provide feedback regarding benchmarks being met.

The EC, along with the PD, coordinates the disbursement of **future national interest funds** in SolCAP which includes the **small grants program**. These flexible funds are also to relieve bottlenecks that arise during the implementation of SolCAP. To determine if re-budgeting is necessary, the PD will request budget reports from subcontracts that will be assessed by the team leaders. Fund re-allocation from this budget line will be made by the PD in consulation with the EC.

SolCAP Small Grants Program. This program will be initiated in 2009. Prior to the yearly budget cycle of each year (by July), a request for proposals will be distributed to the entire Solanaceae research community, through the newsletter, email lists, and the SolCAP website. Proposals will be submitted to the PD, and peer evaluated through the EC. The EC will rank the proposals and consult with the Advisory Board for final assessment before determining funding. The PD will notify the PIs of each proposal's outcome. Quarterly progress reports will be submitted to the PD for review. SolCAP itself is focused on key cross-commodity quality traits, but there are many other traits of value in the Solanaceae. Six key areas we intend to allocate resources to are 1) genotyping mapping populations requested by the greater breeding community, 2) Marker conversion – developing SNP markers linked to QTL into easily assayed (e.g. CAPs or dCAPs) markers by individual research programs, 3) QTL validation and MAS, 4) population development to address emerging needs, 5) Extension or education special projects, and 6) new directions not envisioned at the time of proposal submission. **Note:** The process of selecting which populations to genotype will be based upon known or potential marker polymorphism, importance and number of traits segregating, and evidence of replicated phenotypic data and statistical analysis from the populations.

Data Sharing. Access to the data generated by the project will be available through SGN, MSU, and Genbank. We envision SGN as the portal for SolCAP genotype and phenotype data, and MSU as the provider of many underpinning custom bioinformatic services for this project. Buell is responsible for depositing all sequence data generated in this project in Genbank. All genotype and phenotype data will be available through the project web site through simple interfaces. Buell will also collate all these data and provide it in a bulk format for SGN to provide its broader dissemination.

Intellectual Property. There are four outputs of this research: germplasm, characterized traits, gene sequence and molecular markers. As markers and traits are only of value within the context of germplasm, variety development from the proposed studies will be the most significant long-term outcome. Marker data and sequence will be publicly available through the public databases. We do not anticipate seeking intellectual property protection for traits. Rather, we will protect traits by protecting germplasm. The results of the proposed studies will also be made available by both public and private potato and tomato breeding programs. Germplasm developed as a result of this project will be available according to individual institutional guidelines.

Exit strategy. This project will leave the crop germplasm panels as a community resource. These panels will provide detailed knowledge about the genotype and phenotype of many commonly used breeding lines, which will help guide breeding and research for many years to come. This project will also leave the community with detailed knowledge about validated SNPs and assays that can be used to detect them. We anticipate collaborations with colleagues in EUSol, Canada and China that may lead to buy-ins during and after SolCAP from these and other international groups (*see letters of support*). Valuable germplasm will be curated in their respective genebanks. As we are using current core facilities, there is no equipment or facilities that would be "abandoned" at the end of SolCAP. Raw sequence will be curated in Genbank. As the raw and processed data will also be curated in SGN, the central database for Solanaceae, it will continue to be available and accessible to breeders and scientists in a useful format. A SolCAP symposium will be planned for the end of the project at a site to be determined. Finally, scientific results will be published in journals. After four years, we anticipate that our education and eXtension programs will have trained and informed breeders, growers and extension specialists to use the tools developed. If the material developed is deemed useful, we anticipate that seed companies and genetic service providers may continue to support eXtension activities. Furthermore, we will have developed the CoP that will be leveraged across CAPs and crops. We expect commodity groups and granting agencies to continue to leverage SolCAP research, education and extension outputs and resources.

Table 1. Project Timetable

Obj	Key Personnel	Task	Year: Pre	1	2	3	Beyond CAP
1	De Jong, Van Deynze, Douches, Francis	Translational genomics education	●	→	→	→	→
2	Stone, Van Deynze, Liedl, Francis	Translational genomics extension	●	→	→	→	→
3	Chetelat, De Jong, Novy, Francis	Seed increase for germplasm panels	●	→			
3	Jansky, Haynes, Thill, Novy, Yencho, Vales	Field evaluation of potato germplasm panel	●	→			
3	Francis, Scott	Field evaluation of tomato germplasm panel		●	→		
4	Van Deynze, Buell, Francis, De Jong	Sequencing of potato and tomato cDNAs	●				
5	Francis, Van Deynze	SNP development/germplasm panel genotyping	●	→			
5	Haynes, Francis	Linkage disequilibrium analysis; association mapping			●	→	
5	Francis, Van Deynze	Mapping population SNP genotyping, Panel populations	●	→			
6	Others	Mapping population SNP genotyping, Trait populations			●	→	→
6	Others	Marker conversion/ QTL validation			●	→	→
7	Buell, Mueller	Data curation and management; Database development	●	→	→	→	→
1-7	Coe	SolCAP evaluation	●	→	→	→	→

Fig. 1. SolCAP Management Structure