Summary: The right potassium fertilization management, using adequate amounts of fertilizers and drop rotation can minimize K losses, which is important economically and environmentally. Potassium dynamics in soil profile was studied in soils with different crop rotations history, textures and exchangeable K levels resulting from previous soybean fertilizations during 6 years. Field and green house experiments were conducted and plant K, exchangeable and non-exchangeable soil K were analyzed mostly down to 40 cm in the soil profile. Potassium leaching was higher in the clay soil, which had shown more available K due to a higher residual effect from the previous K fertilization. Leaching intensity was proportional to available K contents. As regarding the non-exchangeable K contents, there was proportionality between soil K and leaching just for the sandy soil. In this soil, initial leaching intensity was higher, decreasing with time, whereas in the clay soil losses were more constant. The residual effect of K fertilizer application during the years in soybean crop, increasing its availability, can result in exchangeable K intensive losses, irrespective of soil texture. Potassium transformation from non exchangeable to exchangeable K is very fast in sandy soils, which makes the replenishment of non-exchangeable K reserves very difficult due to leaching intensity. The use of catch crops as pearl millet, triticale and brachiaria during part of the year can be an important tool in avoiding K losses and re-cycling the nutrient for the next cash crop.